

Authentic

SCIENCE FICTION MONTHLY 1/6d.

No 47

This month's
FEATURED NOVEL

**STRANGER
in TIME**
by S. GORDON

Lost Among the Stars!

Short Stories by: LEN SHAW, R. C. WINGFIELD, RICHARD WILSON
Features by: JOHN TAYNE, G. C. DUNCAN

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Authentic

SCIENCE FICTION MONTHLY

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Feature Story	Page		
STRANGER IN TIME.....	4	by S. Gordon	25
Short Stories			
THE MUTILANTS.....	47	by R. C. Wingfield	16
TO SHAKE THE STARS.....	69	by Peter Green	25 11
ROBOTS' GAMBIT.....	87	by Richard Wilson	12
THE DAY OF ALL ELSE.....	102	by A. G. Williamson	10
THE BRIDGE.....	117	by Len Shaw	11
TRYST.....	131	by W. B. Johnson	3
Other Features			
EDITORIAL.....	2		
THERE'S TROUBLE IN THE FUTURE!....	41	by John Tayne	
LOGIC IS FUN.....	63	Frank Wilson, B.Sc.	
PLANET FARMS.....	80	by G. C. Duncan	
ARISTOTLE.....	99	by H. J. C.	
BOOK REVIEWS—FICTION.....	112		
NON-FICTION.....	114		
THE MARCH OF SCIENCE.....	128		
FANZINES.....	134		
PROJECTILES.....	136		

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H. J. CAMPBELL

Writes...

PERCEPTIVE readers will note this month that AUTHENTIC is no longer bigger than any other British science fiction magazine. While in the past we have been able to give you considerably more value than even magazines which cost more, we find that the time has come for a bit of retrenching. Magazine publishing in Britain is going through a somewhat difficult time—you will be aware that several old-established periodicals have actually had to go out of print.

Whether this is caused by the new disease called television, as some say, I do not know. I am not terribly interested in its cause—only in its treatment. One simple way, of course, is to raise the

price. People are doing it all over the place. But I have never liked that solution. I'm sure you wouldn't like it, either. So, we have cut the number of pages down so that AUTHENTIC is now no bigger (or smaller) than its contemporaries. That is not too bad, is it?

I'm pretty certain that this will be a temporary measure, anyway. Maybe we shall be able to go back to our bumper size even as early as the Autumn. Maybe not. In all events you'll not be suffering greatly. It simply means that you'll have 5,000 words less to read. To balance this, the quality of the stories will be higher, for we are saving on paper and production, not on payment to authors.

But let's go on to pleasanter fields. This month you've got some nice material waiting for you. *Stranger in Time*, S. Gordon's lead story, is a rather fresh and exciting approach to time travel. *The Mutilants* by debut author R. W. Wingfield may chill your spine. Peter Green, a new author who will no doubt be seen in these pages quite often, gives us a poignant piece, *To Shake the Stars*, which I am sure will meet with wide acclaim. Richard Wilson is back with a robot story that will amuse you. Another new author, Anthony G. Williamson, gives us *Day of All Else*. Tell me what you think of it. And I shall be especially pleased to have your views on *Tryst*, an odd little piece, by W. B. Johnson, written in a style that's strange, to say the least. Then we have Len Shaw's *The Bridge*, which digs into the recesses of the mind!

Articles are up to standard, I think. G. C. Duncan's *Planetary Farms* tells us all

about how we are going to eat when we get to Mars. I've done you a piece about Aristotle, which I hope you'll like. John Tayne is back with a most interesting account of problems that will face Earth in the remote future. Then there is the third instalment in the series on logic. I hope you are liking these and not finding them too stiff for you.

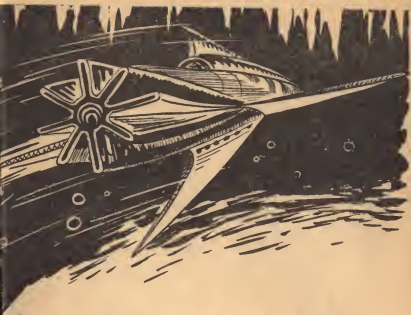
Fan circles these days are raising the question as to how near science fiction can get to present-day life and yet still be science fiction.

I personally believe that stories could be written right in the present day and still be science fiction; while other stories could be written about the far future on some distant planet and *not* be science fiction. All depends on the way it's done.

But here am I talking about something I think isn't worth talking about! I'd better go and read your next month's fare. 'Bye now.

H.J.C.





Half a million years or so, either way . . .
did it really matter?

Stranger in Time

by S. GORDON

“GOOD-NIGHT, Mary . . .
Good-night, Mr.
 Smith . . . Good-
 night, Mr.—er—. Good-night,
 g’night, g’night, ’night . . .”

The staff of the electronics department of Messrs. Quillon and Son were filing out, their day’s work done and calling out to Mr. Revilstone, the buyer, in his little “cubby-hole,” as they did so. They invariably wished him: “Good evening, Mr. Revilstone.” And he just as invariably called back, “Good-night,” despite the fact that the emporium did not remain open after six o’clock.

“Just a moment, Mr. Dinton.” Revilstone emerged from behind his desk with a paper clutched in his hand. “I’ve an invoice here for that new electronic recorder from Weissemitche. I didn’t know they’d delivered it yet. Where is it?”

Ted Dinton paused, cursing the buyer under his breath. He was in a hurry to get home to his attractive young wife and an evening meal.

“I signed for it, as it happens, Mr. Revilstone. It’s over in that corner by the lift.”

“Where? Oh, I’ll find it. You push off.”

Dinton left in a hurry, before the other man should think of a reason for keeping him, and Revilstone made his way across the department.

The new recorder was, as Dinton had said, by the lift. Revilstone placed it on a table and examined it.

It was a beautiful job. He looked it over carefully, noting its points, and wondering in the background of his mind what sort of person would buy it. In spite of his long service with Quillon’s, Revilstone, who had never felt the slightest desire to hear his own voice played back to him and had never had an ear for music, was always being surprised at the number of people who bought recording instruments. He could understand firms buying them, but private individuals . . .

Satisfied that the machine was in perfect condition, he switched off the lights, and made his way to the one remaining exit that was left open for the staff. The duty man, whose turn it was to lock up, nodded good-night

to him as he passed out, and then made his way round the floor on his tour of inspection after locking the door behind Revilstone. Finally, he too went his way to keep his wife company at an evening meal, as the night watchman came on duty, made his way round the emporium, and retired to his little den to brew tea and smoke a pipe, while the darkness of the late summer evening deepened over the surrounding district.

The night rolled on. The watchman made another round, and found nothing amiss. But hardly had he returned to his den to brew more tea when something stirred in the dress salon up on the first floor.

There was a faint glimmering, a whisper of movement. For an instant a thing shaped like a small automobile appeared in a clear space among the racks. Two figures emerged from it. One reached back into the thing, and did something. There was a transient shimmering, and the machine was gone.

The two dimly-seen figures made their way hesitatingly

across the floor and down the stairs to the ground floor.

"Can we hide here?" The slighter of the two figures was nervous.

The thought that answered hers was but a whisper.

"We must hide, Mayina. Can we trust the inter-stel police not to track us to this sector?"

Had the watchman been nearby, he would not have heard them. They conversed telepathically.

"Surely they will follow the machine on into the infinities? We have sent it on its way with hardly a pause."

"But we did pause—and our instruments recorded that they have had a trans-temporal beam on us almost from the commencement of our journey. They too will pause. If they find no trace of us they will follow the machine. We must hide for a time, then try to reach the other machine by the river. Vilgo grant that Jenryn has received our message and left it there."

"I don't know this sector. Can you find your way, Reyell?"

"I think so—but we must

first find a hiding place. If we try to get there at once and they stop in this building, they will be able to track us if we are moving. We must stay still till we are satisfied they're gone."

They found more steps leading down to the basement.

"Can we find a hiding place down there, Reyell? I'm afraid."

They paused in the electronics department, and looked around.

The stairs descended by the lift well. In front and a little to their left was a table with what appeared to be a small radio set on it. Reyell stepped forward and examined it with interest. A smile curved his lips.

"A recording instrument, Mayina—but how crude and inefficient. Still, these barbarians had the first faint glimmerings of reason . . ."

A vibration shook the building, a tremor that would have passed completely unnoticed by any human of the day. The watchman in his little den, drinking tea, did not sense it.

"They are here."

"Remain still, Mayina. We

are but two; they are many. They cannot detect us through the floor slab above, as we can them. They may go on. But if they come down here——"

Mayina's eyes were on the little instrument on her wrist. "They are descending the stairs to the floor above us. Oh, Lord Vilgo! What shall we do?"

His eyes were on the machine in front of them.

"We must get a message through, even though we ourselves fail to return."

He glanced round the basement, seeking a power point to which the machine might be connected. Conditioned as his eyes were to the dark, they soon found one.

TED DINTON muttered something under his breath, and rolled over. He snatched the telephone from its cradle, with a resentful glance at the clock. The time was shortly after six a.m.

"Hello; Dinton . . . What! Good Lord! Yes, of course; I'll be over as soon as possible."

Susan sat up and stared as

he dived out of bed and hastily started to dress.

"What's up? Who was it?"

"Revilstone. He 'phoned from the shop. Somebody dead in our department, apparently. The police are there. He wants me to go on over."

"Dead! Who?"

"I don't know any more than you do. Strangers. Two of them." He fumbled for his shoes.

She threw the covers back and slipped to the floor.

"You must have something to eat before you go—I'll get something for you." She slid her feet into slippers, and ran out to the tiny kitchen, snatching up a wrap as she went.

Dinton found Revilstone talking to a quiet, gentlemanly individual who turned out to be Inspector Benner.

"This is terrible—of course, it *would* happen in our department—Mr. Quillon is on his way in; I 'phoned for him, too. The Inspector wants to know if you can identify these people, Dinton. He thought at first they might be employed by Quillon's—I was able to tell him they were not..."

Dinton shook his head as he looked down at the two crumpled shapes beneath the sheets which had been flung over them, leaving only the heads visible.

"I've never seen either of them, to the best of my recollection; and I wouldn't be likely to forget the man's hair style, if I'd seen it. Shoulder length at the sides, fringe in front——"

"And shaved up to the crown at the back," the Inspector finished for him. "Something odd about the girl's hair, too, for that matter, although women have some pretty queer styles these days. But their hair isn't the only thing. They are both stark naked, and the tan on the bodies seems to indicate that the man was in the habit of wearing nothing but trunks, and the girl not much more."

"Could they be people from some nudist colony who decided to come here and commit suicide for some reason?" Dinton suggested. "Incidentally, who found them? And what killed them?"

Benner shook his head. "The night watchman found

them shortly after five o'clock. And we haven't a clue as to what killed them, till we get a p.m. There's not a scratch on either of the bodies. My guess is some kind of poison."

Revilstone glanced round the department.

"What about electrocution? There's some pretty high voltages generated by these sets, you know . . ."

His eyes became fixed. He walked a few paces over to the machine by the lift.

"That's odd. I was the last one out of here last night, and I'm prepared to swear that machine wasn't connected up to a power source when I left it."

The Inspector joined him. "What is it?"

"New type electronic recorder and reproducer. Runs off either mains or batteries. You plug one of these little electronic tubes in, turn this knob to the left, switch on, and the tube will record anything up to about one hundred thousand words. We can get bigger or smaller tubes, of course. Turn the knob to the right, switch on, and the

machine will read back to you. That red dial lights up if you try to take a recording on a tube that's already had one. We are anticipating a great sale for invalids who want a machine that will read them to sleep——"

"Was there a tube in it last night when you left it?"

"Eh? No, of course not. I wouldn't take a chance of——"

Benner turned the knob to the right and switched on.

"DID you see that funny expression on their faces while that thing was talking to them?" the finger-prints man remarked to the sergeant in the background. "They looked quite dazed. Wonder what it said?"

The sergeant did not answer. He watched as the Inspector took something from the interior of the machine and slipped it into his pocket.

SUSAN awakened with a start. Somewhere a door had closed quietly. But she had been worrying subconsciously over Ted, and slight though the

sound was, it still penetrated through the mists of sleep.

She reached out an arm, and switched on the table lamp. A glance at the bed beside her own showed her that it was empty.

Some slight indisposition, she thought, and lay for a while, drowsily wondering if he was all right. Then she roused herself up. The clock told her the time was one a.m.

A moment later she sat up with a sensation of shock, and stared incredulously. The chair beside the wardrobe on which he usually laid his things was as empty as his bed. He had dressed and gone out.

Even as she leaped from the bed, she heard the hall door close below, and the sound of his footsteps on the front path. Running to the window, she was in time to see him close the gate behind him, and walk briskly away down the street.

For a second she hesitated, divided between utter bewilderment and a sense of fear. In the two years of their marriage nothing of this nature had happened before. Or had it?

She knew she was normally a rather heavy sleeper. Was it possible that he had left the house on other occasions and returned without waking her?

Susan had no wish to spy on her husband, but she had been uneasy over him all the evening. He had been so quiet and subdued, so unlike his usual self. And all he had told her of the deaths was that no one knew who the people were or how they had come to be in the emporium.

She ripped her night attire off, and hastily slipped on a frock. There was no time to do more than make herself presentable for the street. She ran down the stairs, pulled the door shut behind her, and hurried down the street. She saw him, as the moon showed momentarily from behind a cloud, then he was lost again in the gloom.

Down one street and then another. She was gaining on him. The fear in her mind was that he must be sleep-walking, and that he might come to harm before he awakened. Even if he came to no physical harm there would be a certain amount of mental

shock if he awakened to find himself out of doors in the middle of the night.

Dinton turned into River Walk. She ran, fearing what might happen if he reached the river before she could catch up with him. He was already on the river bank, making for a dense patch of shrubbery, as she emerged from the end of the street. But he was no longer alone. Another dimly-seen figure was with him. They disappeared into the bushes.

Susan faltered and stopped dead. Something turned over within her and her heart started to thump. Memory reminded her of the tales she had heard of erring husbands, the many scandals that had come to her ears. The poison which some women are so fond of disseminating among themselves, and which is nine tenths idle gossip, was at work.

Anger blazed up in her. Furiously she forced her way through the bushes. In the middle was a dark shape, like a small car. A figure was in the act of climbing into it.

Susan did not hesitate. She

had no idea what it was all about; all she knew was that her husband was acting very strangely, and she was going to find out, if she could, just why.

She hurled herself through the opening, and fell on someone's lap, feeling arms close around her. For a moment she struggled while a door slid shut behind her, then relaxed. There was sufficient light for her to see that it was her husband who held her.

"Ted," she said, and was vaguely surprised at the brittle coldness of her voice, "would you mind telling me what this is all about? Who is this—this—"

Her voice faltered and broke off. She had just realised that the person sitting beside her husband was a man.

Anger was swept away by fear as she noticed their expressions. They both stared ahead with eyes that apparently saw nothing consciously. The faces were set like stone, with an inhuman quality about them that excited a revulsion within her. For a moment she struggled, but the arms holding her did not relax their grip.

"Ted!" she screamed, in sudden terror, and struck at him with both hands.

Neither man showed the slightest sign of having heard. They continued to stare straight ahead unseeingly. She twisted her head in an effort to see out of the enclosed cabin in which they were. There were no windows—nothing but the metal walls.

Claustrophobia touched her briefly as she noted the fact, to merge momentarily into wonder as she saw the control panel in front of the other man.

It was like nothing she had set eyes on before. There were dials, flashing red and green and violet lights, a vivid strip of blue along which a tiny white dot was slowly creeping, pushbuttons and tiny switches and levers . . .

She relaxed, sobbing, in her husband's arms. She wondered if he had been drugged in some manner. What kind of machine was this they were in, and what was the purpose of the whole mad adventure? She could not guess and tried to calm her overwrought nerves. She could do nothing while Dinton held her so tightly.

Another dot had appeared at the extremity of the blue strip, and was slowly moving to contact the first white dot she had noticed, but she was not interested. All she wanted was to get Ted out of the thing and to a doctor . . .

Abruptly the man sitting in front of the panel leaned forward and touched a button. The door behind her slid back noiselessly. White light poured into the cabin.

Susan struggled free from the arms which had imprisoned her, and leaped through the opening, to pause with a feeling that her mind must have given way under the strain of the past few minutes.

The night and the bushes were gone. The light came from a dazzling white sun which was almost overhead.

She stared around her wildly. She stood, almost knee-deep in lush grass, in a small clearing surrounded by tall trees. And in front, at a little distance, were two men such as she had never before seen.

Susan gave a strangled cry, and felt behind her for the door of the machine. In

that moment she felt it to be something sane in an insane world. She felt that if she could only get back into it and close the door, it would return her to——

Return her? From where? Where was this place? How could the machine have moved her in such a short time from the night of the river bank to—wherever she was?

Abruptly she was pushed aside as Dinton and his companion strode past her and approached the strangers. Their faces were as blank as ever. The men in front watched with a calmness that was more frightening to her than any threat or show of violence could have been.

"Ted!" The cry was a wail that went unanswered.

She felt a stirring in her mind, as though somewhere a conversation was being carried on though she was unable to hear it with her ears.

Dinton and his companion came to a pause in front of the two men. The unheard conversation ceased to echo in the depths of her mind.

Susan tried again to fight down the hysteria which per-

sisted in attempting to express itself. Frantically she told herself there must be an explanation for the crazy series of events which had happened from the moment she had awakened. If she *was* awake.

The man who had accompanied Dinton and herself in the machine held out a small cylindrical object to the nearer of the two men facing them, who took it and turned it over in his hands curiously as though wondering what it was. For a moment he seemed to hesitate, then he raised his arm and spoke into a tiny disc-shaped instrument which adhered to the back of his wrist, with no sign of strap or other means of attachment.

There was a silence. The four men stood like statues, while Susan gazed from one to another, trying to raise enough courage to speak. Then, suddenly, a man appeared from among the trees which fringed the clearing. In his hand he carried a small metal box.

He approached the two men and inclined his head to them. Taking the cylindrical object from the one who was holding it, he opened the box and

the little house which she and Ted had shared for nearly two years . . .

The sound of the door sliding back awakened her. For a moment she lay staring stupidly at the dazzling sunlight which streamed into the cabin, then she heard her husband calling from somewhere outside.

"Susan! We're home."

Still half asleep, she stumbled over to the door, and looked out.

The machine was resting on a lawn that was more grey than green. In the distance white towers thrust up through masses of blue and gold foliage. A white sun stared down at her out of a sky that had a touch of violet about it, and in the opposite quarter of the heavens a monstrous round bulk was visibly rising, thrusting itself up above the horizon, a world so near that, with the naked eye, she could see the continents and seas through the misty tenuous veil of its atmosphere . . .

Susan leaned against the door frame with a sob. Home!

The word was a mockery. She knew then that home as Ted understood the meaning of the word would never be home to her. She could have made her home with him in China or any other part of the world she knew, but a civilisation so far in advance of hers she could never face. At that moment the beauty of his world meant nothing to her.

THEY stood before the Supervisor in a room within a building that combined austerity with grace, massiveness with beauty. His eyes rested on her for a moment with something of kindness and understanding in them. He waved her to a seat, and turned to Dinton, who remained standing.

Susan felt the echoing commence within her mind, and knew they were in soundless conversation. She leaned back wearily, and closed her eyes.

"Jenryn Dinton, we have read your report. Frankly, I am not pleased with the ease with which the enemy agent Benner, or the man you knew as Benner, succeeded in duping you."

her. She did not know where she was or of what race they were, but one thing she did know—they had powers beyond any known to her own people, of her own time . . .

Her own time. Sudden realisation swept through her, and with it a sickening feeling of weakness not untinged with horror.

Time travel. They were in a time far in advance of hers.

For a second doubt entered her mind as she glanced up at the sun above her head. There was a difference, a strangeness in the white glare; and the altitude of it . . . She might have been in the tropics.

The gabbling voice cut off abruptly. A voice spoke to her in English.

"You are not under the control of the machine. Who are you?"

Glancing up, she saw that it was the third man, the one who had entered the clearing with the box. His voice was gentle, but there was a steely inflection and a power about the tone which made her shudder. She wondered wildly what these men would do to them.

"Nothing, unless you fail to obey our instructions." The voice answered her thought, with a touch of impatience in it. "Yes, we converse telepathically. But we shall not intrude on the privacy of your mind if we are satisfied you are trying to answer our questions truthfully. I see, though, that you are wife to one of the men who accompanied you here. Which one?"

Susan dumbly indicated Dinton, who was still gazing in front of him. The man smiled faintly.

"Reyell under-estimated the sexual possessiveness of the women of your sector, I think. It does not matter . . ."

His head turned sharply. Susan felt the strange stirring within the depths of her own mind, which told her he was in mental communication with the other men of his race. Then he turned back to her.

"Come. It is urgent. We must leave at once."

She found herself running for the trees with the rest of the little party, leaving the machine in which they had arrived behind them in the

clearing, and she wondered briefly what was to become of it. Even as they reached the trees, however, a man passed her, sprinting towards it. Evidently it was not to be left there.

There was, perhaps, a minute of running along a little path between the trees, then they emerged into a vast field of grass, sunbaked and withered. She saw perhaps a dozen of the strange machines, with men, many of them, running for them; but these machines were far larger than the one they had left in the clearing. They reached one and clambered in. She sank gratefully into a seat. The run, short though it was, had winded her.

For a time she sat limply, trying to adjust herself to the incredible situation, then she roused and glanced around.

She realised that the machine was capable of holding at least fifty persons, but there were not more than a score within it, of whom many were women. The fact helped to make her feel more at ease, in spite of the fact that they were all strongly

built, as were the men. Like the men, too, they had a strength, an implacableness, about their features that rather disturbed her. Many of the men wore only trunks, of some dull, grey material; a few also wore jackets of the same material and colour, as did all the women. At the end of the machine she saw a control panel, similar in all respects to that which she had noticed before in the smaller machine. The little white spot was slowly creeping along its strip of blue; she knew now that it must indicate their position along the time-dimension.

"A spatio-temporal shift, actually." The voice of the man sitting beside her cut into her thoughts. She glanced round with an embarrassed flush on her face, and he smiled apologetically. "I know I promised, but it's rather difficult not to read a mind like yours; you have no mental shield to think behind, as we have."

"I don't really mind," she answered. Oddly enough, she meant it. He was not hostile, and she knew it was impossible to judge him as though he

were a member of her own race. "Only you'll have to forgive the chaotic nature of my thoughts, I'm afraid. But—please, won't you explain what this is all about? And when will my husband be released from the hypnosis? He is hypnotised, isn't he?"

He was silent. She felt once more the odd echoing within her mind, and knew he was in communication with others.

"I am not forbidden to inform you," he said, abruptly. "It is, perhaps, a little difficult to tell you so you will understand; your language is too simple. But we are, I think, what you would mean by a guerrilla force."

"A guerrilla force!" Her heart sank within her. "There is, then, a war?"

"There is war," he said, gravely. "War such as you can neither grasp nor, possibly, believe. But we are cut off from our main forces in the primary spatio-temporal field, and are acting to the best of our ability within the confines of the secondary channel." He broke off as he realised that she had not the faintest idea what he was

trying to tell her. "Well, it doesn't matter. But two of our best operatives, Reyell and Mayina—they were brother and sister—tried to obtain information about the disposition of the enemy's strength along the tertiary band, which cuts across both primary main and secondary channels. If there is a weak spot somewhere along that line it would probably pay us better to try to break through rather than risk losing ourselves in an attempt to outflank them along the quaternary line, which is largely unexplored territory." He broke off suddenly, leaving Susan with a feeling that he had said more than he should. Whether it was so or not, it gave her a sensation of greater confidence to imagine that he was capable of some of the weaknesses of the men of her own time.

"But my husband?"

"We'll awaken him as soon as possible after reaching our destination, but it will need care."

Susan felt more satisfied as regards her husband, but she wondered how long they would

be kept prisoner before being sent back to their own time, while the fear persisted in the back of her mind that their captors had no intention of releasing them.

She glanced up sharply as the door of the craft slid back. A dim light seeped into the interior.

Possibly dawn or dusk, she thought, and wondered what year they had arrived at. Somehow her mind seemed to have accepted the fact of time travel without much difficulty, possibly because she could not understand it.

She followed the others out of the machine, and stared around her.

The little fleet of machines was scattered over the surface of a wide square surrounded by buildings; low, single storey structures. Susan was reminded of army huts. The air was chilly, and the ground, which appeared to be of concrete, was covered with a thin layer of grey dust. She was breathing fast, and had a sudden feeling that the air was thin. Then she realised that for all the weakness of the light, it came from above,

and she glanced up. A puzzled look appeared on her face.

The sky above was a dull dirty-looking yellow. Instead of a sharply defined sun, she saw three blurred discs of light, which might have been suns seen through a haze.

"I told you." The voice behind her had a touch of impatience in it. "A spatio-temporal shift. We move in time and space."

Panic swept over Susan as she grasped the meaning of his words. She glanced wildly around her as though seeking a refuge.

"Make your way to that hut over there. I'll send your husband and the other man over to you as soon as we have released them from the hypnosis."

Susan slowly made her way to the hut indicated. Her mind was trying to grasp the truth: that they had travelled not only in time, but in space as well; that she was on an alien planet at an unknown distance from the Earth.

The two men joined her in the hut some twenty minutes later.

Susan had already examined it. There was a large room, apparently intended for a living room, to judge by the table and seats in it; two small rooms which were obviously for sleeping, if the couches were anything to go by; and a toilet.

There were various small mechanisms which she did not care to tamper with, and whose use she could not imagine. There was no sign of radio, television, or books. She wondered what had taken their place.

The place was brightly lit, and so it was rather surprising that she did not think to ask herself where the light was coming from till the men arrived. But then she was still worrying over her husband . . .

"But what is it all *about*?" Ted Dinton was still shaking from the shock of finding himself in such a place. "You say we are on another planet, Susan? But why in the name of the devil did they bring us here? Who are they?"

Susan explained all she had been told.

"A war in time and space? It's crazy. Anyway, if they are in the habit of travelling back through time, how is it we haven't seen something of them before?"

"Well," Benner cut in, "there's no real reason why they should pick on our planet out of the planets of the Galaxy. In any case, it's quite possible they never travel as far back as our time—usually, that is."

"And you think that in this case two of them *did* come as far back in time, and were caught by their enemies in Quillon's, quite fortuitously."

"If that is what happened, then why did they leave their machine on the river bank?" Susan asked.

Benner spread his hands. "We don't know enough to be able to say. Possibly these machines can actually fire on one another while travelling through time, and the two spies just panicked, left it there, and ran up into the town to hide."

"Revilstone was with us when we listened to the recording. Why didn't he try to get to the river?" Dinton asked.

"Probably did, and got there too late. We'd gone."

"But when will these people return us to our own time?" Susan was worried. There was a sickening certainty within her that she would never again see her own time and the home she had grown to love so much during the two years of their married life. Perhaps it was just as well that her mind was incapable of really grasping the enormous abyss of time and space that separated her from everything, with the single exception of her husband, that she held dear.

Benner shook his head. "I don't think we can rely on them. Put yourself in their position. From what you were told on the machine coming here, Mrs. Dinton, they are behind the enemy lines, cut off from their friends in both time and space. Do you think they will have time to worry about us? About all we can do is to wait for a chance to seize one of these machines and try to get back. I seem to have a hazy memory of how they work."

"I should strongly advise against such a procedure."

Susan started to her feet with a smothered cry. She recognised the voice of the third man in the clearing. A moment later the man himself appeared in the doorway of the room. There was a faint smile on his face as he looked at them.

Ted Dinton leaned back in his seat for a moment before starting to rise. His face was white. Knowing her husband, Susan feared an explosion which would be unlikely to do them any good. And yet in that second she had time to notice that he matched the other man in liteness and easy grace of movement. Even the dark swarthy skin, she thought, matched those of the people among whom they had been flung.

"Look——" Dinton commenced.

"Just a moment, Mr. Dinton." Benner also was on his feet. "Let me handle this. Look, Mr.—er—I don't know your name——"

"Call me Janton." The man in the doorway had not lost

his smile, though he must have known he was not exactly regarded as a friend by the people in front of him.

"Look, Mr. Janton, you people have used us for the purpose of getting a report through from two of your operatives. Well, we are glad, of course, to have been of service to you, even if it was involuntary on our part, but we do feel that we have a right to expect you to return us to our own time and planet as soon as you can conveniently do so."

Janton gave him a rather odd look. "That is not what you are thinking," he said. "What you really mean is that since we are so immeasurably far ahead of you, it would not be wise to antagonise us, and it is better to let us think you will be willing to wait if you can be sure of being returned to your own place in due course."

Benner started to protest, and Susan interrupted him.

"You forget that these people are telepaths, Mr. Benner."

Benner subsided rather suddenly into his seat. The smile

had left Janton's face. He strode forward and seated himself near them.

"Yes, we are telepaths." His gaze swept over them, and they flinched as they sensed the steel in his nature, masked by his gentle voice. "One of our race controlled two of you quite easily merely by making a voice recording. You might also remember that."

For a few seconds there was silence while the three Earth people stared at him, numbly.

"I overheard what you were saying just before I entered, Inspector Benner; partly telepathically, and partly by hearing. And my advice to you not to attempt to seize one of our machines was not prompted entirely by selfish motives, as you may think. It is an unfortunate fact that we have more machines than personnel to man them."

He leaned forward slightly. "Tell me, what do you people know of time?"

Dinton made an impatient movement. "Of course, we know that time is regarded as the fourth dimension, and

that neither space nor time can be thought of apart from each other. Everyone knows that nowadays—er—I mean, of course, in our own time. Anyway, I don't see what there is so difficult about things. If your ships are capable of travelling through time, surely we couldn't go wrong. All we have to do is to go either forward into the future, or back into the past, and that's all there is to it."

"Unfortunately, Mr. Dinton, that is not all there is to it."

To Susan the whole situation seemed unreal. She sank her head into her hands for a moment. It was crazy to imagine that she was sitting in some hut on some far-distant planet, possibly thousands of years out of her own time, listening to two men discussing problems of space and time. She pinched herself furtively, and felt again the sense of embarrassment as Janton smiled at her.

"What would you say if I told you that the dimensions of space and time are quite literally infinite? Space—and time."

"You mean——?"

"Think of any three dimensional object. It is finite, of course. But it takes an infinite number of cross-sectional areas of infinitesimal thickness to make a three-dimensional solid. In the same way, it takes an infinite number of three-dimensional figures to make a finite four-dimensional figure, and an infinite number of four-dimensional figures to make one finite five-dimensional figure——"

"But surely infinity is just a mathematical abstraction?"

"No one has ever yet seen a four-dimensional figure, and if such a thing exists, then mankind will never know it." Janton's voice was dry. "But the dimensions exist, extensions into unknown space-time continuums. The analogy I have given you is unspeakably crude, of course; your language is not advanced enough to give you a truer picture of the Greater Cosmos, but in the meantime you must accept my word for it that there is more than one dimension of time, just as there is an infinite number of three dimensioned universes re-

peated to infinity. And our machines are constructed to manoeuvre in three dimensions of space and two of time. You may think of time, the time we move through, as an area, if you like. That is why I repeat, you must not try to get back to your own time in one of our machines without one of our race to guide you. To us the loss of a machine would not be of much consequence; to you, it might mean getting lost in some crazy time sequence beyond your imagination to visualise—or ours.”

He stood up. “If we can, at any future time, return you to your own place and time, be sure we shall do so. We are not inhuman, whether by your standards or any other. But it is not at the moment possible. The enemy has bands scattered through both time and space, and we shall be hard put to it for the next few of your weeks to avoid capture or death.”

The smile was back on his face. “Our last camp was merely a temporary one; we had to leave it in a hurry, to avoid discovery. This one is a

permanent encampment, protected by a warped force-field which renders everything within it invisible to any searching beam they may turn on the planet. Only a chance landing directly within the boundary of the screen could reveal us to them. We are, of course, using only sparsely populated and deserted planets for our hide-outs.” He paused for a moment, his eyes on their faces.

“You will be treated with consideration, so long as you do not attempt to do anything we may construe as being against our interests. Meanwhile, this hut is yours. And a further word of warning: when you come to explore this camp, do not attempt to force your way through the force-field, or you will find it a painful business; in fact, if you try hard enough, you may kill yourselves. I suggest that you try to get some sleep now; you probably need it.” He turned and left the room, leaving them sitting in a stunned silence.

Susan was the first to break it. “I think he’s honest,” she said, doubtfully.

Dinton made a strangling noise.

"Honest!" he said. "Oh, yes; he's honest, all right. Any time he's going our way, he'll be pleased to drop us off, if it's convenient. Otherwise, it's just too bad."

Benner shook his head.

"You know, Mr. Dinton, you're not being fair to him. Put yourself in his place; a member of a guerrilla band, flitting from place to place behind the enemy lines, doing what damage they can, no doubt, but for the most part just striving to avoid capture or death. Probably they have no supplies apart from those they manage to commandeer. The fact that they are using space-time ships and darting backwards and forwards between now and tomorrow or last century on a score of planets, possibly, does not alter their position, you know."

Dinton growled in his throat. "Look, I'm not denying all that. But do you really believe all that tripe he dished out to us about an infinite number of dimensions of space and time, and travelling through or

across an area of time? Because if you do, I don't."

"I see no reason why all that shouldn't have been the truth. If we can accept what's happened to us, we can accept anything. What puzzles me is why he should have thought it necessary to tell us all that. He had some reason for doing so, I'll be bound."

"That's simple enough." Dinton's tone made it evident that he put no trust in their captors. "He overheard you say that you could operate the transport or whatever they call it, and he was afraid we might actually succeed in escaping with a machine. I still think we should, though we shall have to be careful how we do so."

"I only said I *thought* I could remember how they are operated." Benner sounded doubtful. "All the same, I think you are right. Apart from anything else, there's the risk that if we stay here too long their enemies might turn up, in which case it's anybody's guess what our fate would be. We'd probably be killed in the rumpus. But we're too tired to think straight at the moment.

I suggest we take our friend's advice, and sleep on it; we can't decide on anything till we know more about this place. We don't even know that the planet is habitable outside this camp."

Susan said nothing; she was trying to fight down a flood of hysteria which threatened to overwhelm her.

AT CLOSE quarters the force-screen appeared rather like a dust haze. The three Earthlings moved forward cautiously.

Through it could be seen the surface of the planet, distorted and changing shape with their every movement. It was, to all appearances, barren; the only features they could make out were rounded contours which might have been either hills or sand dunes.

While they slept the three blurred discs which were suns had changed their positions, both with respect to one another and to the planet. Susan, glancing up at them, wondered how much time had elapsed. There was no means of telling. None of them wore a wrist watch, but she felt almost completely her usual

self, which rather suggested that she must have been asleep a long time. Her gaze shifted to her husband as he moved forward suddenly.

"Don't, Ted; you know what Janton said about danger."

He ignored her, and forced his way into the screen for perhaps a foot before there was a coruscation of snapping green sparks, and the thing flung him back, his face contorted with pain. After that verification of the truth of Janton's statement, they made no further attempts on the screen.

Rather aimlessly they wandered away, but they already knew that there was nothing new for them to explore. The place was just a landing field with a circle of huts set round it. Many of them were obviously living quarters for the men and women, numbering perhaps two hundred, who made up the force. Some were just as obviously workshops, and others were closed and shuttered. Small though the place was, it could quite easily have held five times the number of people actually

using it. Susan wondered if the band had dwindled to its present numbers from a much stronger force, and shivered.

"What is it, Susan?" Dinton's eyes rested on her thoughtfully. "Are you cold?"

"Oh, Ted—no, it's not that. I'm frightened."

He paused and gently took her in his arms, while Benner disappeared round the corner of the hut in front without a backward glance.

"Dearest, they won't hurt you. We aren't even confined in any way, so far as the camp is concerned, at least." He made a grimace as he glanced at the force screen.

"Darling, it's not that. It's as though I knew, somehow, that I shall never see home again, or any of the people we know. It's not physical hurt I'm afraid of. Oh, Ted!" She broke down and wept a little, while he held her close and whispered to her.

She drew away at last, and gave him a faint smile.

"Anyway, we've got each other, Ted, and that's all that matters," she said, dabbing at her eyes.

"Yes," he said. His eyes rested on her face strangely. "Yes, that's all that matters." He glanced at the corner round which Benner had disappeared. "We'd better see where the Inspector has got to."

They found the Inspector busy with a bulky item of equipment outside one of the huts. He had discovered that the mechanism was capable of being rotated, and was examining it from every possible angle.

"I shouldn't touch anything if I were you," Dinton said, with a touch of nervousness. "The thing might be a weapon of some kind. Besides, I don't suppose they will be particularly pleased if we handle any of their stuff."

Benner straightened and glowered at the thing.

"If it is a weapon, it's about the craziest one I've seen. And you needn't worry about these people; there's no sign of them at the moment."

"They certainly don't seem to be bothering their heads much about us," Susan ventured. "But then the only way out of this camp, so far as

we know, is by using one of the machines."

"I suppose they think we won't dare to pinch one of the wretched things," Dinton growled. "Well, there's one consolation: Janton's the only one who can read our thoughts. He's the only one who can speak our language."

"You don't know that, Dinton. If any of them understand English, it doesn't necessarily follow that they will acquaint us with the fact."

How little any of them knew, Susan thought. The sleep had refreshed her; she felt restored physically, but the near-hysteria of the previous day had given way to a sense of depression. She was not given to self-analysis, but she realised that it arose, in part, from her feeling of hopeless inferiority where their captors were concerned.

Supposing they never returned to their own time and planet, could they possibly settle down in a world where even the children, she supposed, would of necessity talk down to them? Where even the simplest item of equipment was beyond mental under-

standing? Supposing something happened to separate her from Ted, what would she do? The thought sent a cold shudder of fear through her, and she moved closer to him.

Benner started to move again, and they followed him. They passed between two of the huts, which apparently had been built from sheet-metal sections, and emerged on the landing field. Apart from two men doing something to a complicated machine in an open workshop, and a woman crossing the field in the distance, the place seemed deserted. Susan wondered if the rest of the band was out on a foray. There were plenty of the machines scattered about on the surface of the field, but if Janton's statement that they had more machines than men to man them was correct, it was quite possible that there were only a few people left in camp.

"Anyway, what are we going to do now?" Dinton asked, after a brief pause.

"About escaping, you mean?"

"Yes."

"I don't think we can rely

on these people sending us back to our own time and place. What guarantee have we that they will? We may be dragged about with them from one place to another for months or even years."

"That's just it. I think we should try to escape."

"Agreed. And since one time is as good as another, what about this machine in front of us?"

Susan opened her mouth to protest. She was terrified at the mere thought that they might find themselves adrift in time. But the two men, after a hasty look round to make sure they were not being observed, had slipped through the open door of the machine, and she had no option but to follow. The door slid shut as she entered. Benner touched a button, and she saw the little white spot commence its journey along the blue strip, this time in the reverse direction.

"I don't like it," she said. Her voice had a tremor in it. "You know what Janton told me about primary and secondary channels and so on. There are four rows of controls on

that panel. How can you be sure you've used the right buttons? We may find ourselves anywhere in the time-area."

"Don't worry, Susan," Dinton said, absently, his eyes on the blue strip. "Benner used the right controls."

Susan said nothing more at the time, though she felt extremely doubtful. For one thing she could not see how they could be so sure what controls to use. After all, they had been under hypnosis when they had taken the first machine to the camp in the woods. And what drove the machines? Suppose they ran out of fuel . . .

The minutes dragged by while she sat worrying, thinking up first one possible predicament and then another, and the little white spot crept along its track. The two men said nothing. The little dot that represented their destination appeared at the other end of the blue strip. It would not be long now, she thought. Subconsciously, she noticed something odd in the attitudes of the men. They had drawn apart, and were

gazing at each other as though seeing one another for the first time. Then Benner leaned forward and touched a button. The door slid open.

Dinton's face contorted horribly for a second.

"*Gwympre, Terdua Vilgol!*" The words were a snarl, and Benner smiled.

"Yes, Mr. Dinton; tricked."

Susan crammed a fist into her mouth in an effort to suppress a shriek. Through the open door she saw a landing field, with a sparse scattering of machines, stretching away to where buildings rose, perhaps a mile or more in the distance; strange outlandish shapes, towers, spires, aerial bridges soaring in fantastic curves between them. Something streaked soundlessly across the brilliant mauve sky above, travelling too fast for her to make out its form; and somewhere an alarm was wailing . . .

"Yes," Benner went on, still speaking in English. Susan, standing watching the crumbling to pieces of her life, wondered dully if he was using the language solely for her benefit. "Yes, it must be a

shock to you to find we also have agents in the second half of the twentieth century. After all, it is a long way back in time. And it may seem ironic that I, an enemy, should be the one to hand over Reyell's message, but it was necessary that we should know where your band is hiding."

Susan's gaze left them, and turned dazedly to the doorway. Far away out there, in the direction of the buildings, was a small object that seemed to grow by leaps and bounds as she watched. A ground vehicle, coming fast.

"Of course, if they forget to carry out a routine inspection of their transporters before using them, some of your band will arrive here before we get a chance to round them up. I managed to alter the control-leads on at least half a dozen of the machines while you were asleep last night——"

The words ended in a gasp of pain. Susan, cowering away from them both, felt a sudden mental shock, and knew she had caught the merest fringe of the unseen force Dinton had flung at his enemy.

Benner reeled back for an instant, and Dinton leaped to the control panel, only to pause, straining, as the other reasserted his powers. Slowly, step by step, sweating with the prodigious mental resistance he was exerting, Dinton was forced away from the panel.

Benner could not keep it up. Suddenly Dinton broke free, and again hurled himself at the panel. If he could only touch it for one brief second, before the interstel police arrived to aid Benner . . .

Even as his fingers reached for the buttons, Benner threw a mental bolt at him that sent him reeling sideways. He collapsed for a second, while Benner strained to hold him there.

There was the faintest suspicion of a screech from outside, and the thud of feet . . .

Susan leaped like a panther. Her fingers struck the buttons entirely at random. Agent from some unimaginable civilization he might be, but Dinton was still her husband. The machine reeled and twisted, while the door

slammed shut with a crash that rang through the cabin.

With a shriek Benner turned to the panel, and Dinton had him. Physically, this time. His clenched fist moved so swiftly that Susan saw only a blurr. It struck the other man where neck joins head. Benner's face smashed horribly on the forward wall of the cabin. He slumped and crumpled to the floor.

Susan sagged against the control panel, staring down at the body with dilated eyes. Dinton looked at her thoughtfully.

"Sorry, Susan," he murmured.

He stooped, caught Benner by the shoulders, and dragged him away somewhere to the rear of the vehicle out of sight. Susan collapsed rather than sat in a seat. Her stunned mind was beginning to work again. She cringed away as Dinton returned to her.

"Susan."

She could not meet the compassion and sadness in his eyes.

"You——" The agony in her throat made her speak in

a whisper. "—you are an agent—"

"Dearest, I am not of your race or civilisation, but I am your husband, and I love you."

Susan bent over the seat in front of her, sobbing her heart out, and Dinton spent precious minutes whispering to her, trying to make her understand, while the machine hurtled on through the unknown. Vaguely, through the mist and pain of heartbreak, she heard him pleading, trying to explain.

"Darling, I know I should not have done it, but I had been at Quillon's for three years when I met you, and I looked like being there for the remainder of my life. I know I shouldn't have married you under false pretences, but I wanted you, and I was prepared to settle down for life with you. If I returned to the band it would only have meant a lifetime, possibly, of wandering with them till we were either killed or captured. Do you blame me for trying to make a new life with you? Susan, don't cry so. Susan!"

Eventually, with the fear that he had married her merely

for the purpose of giving verisimilitude to the part he had been playing partially removed from her mind, she calmed down sufficiently for him to be able to leave her and inspect the machine. She watched him dully, with little interest in what he was doing, notwithstanding the fact that her own life as well as his depended on his being able to discover just what Benner had done to the control leads at the back of the panel. The knowledge that he had married her because he loved her had done something to quieten her overstrained nerves, but her mind was quite literally crawling.

Never before in her life had she felt so utterly and appallingly naked; and with it was an unutterable feeling, too, of loneliness. The desolation which she had faintly glimpsed back at the camp, when she had wondered how she would fare if she had to face life in the future without Ted, now had taken complete possession of her.

Even if they returned safely, what would there be for her? A lifetime of trying to live

with a super-man from the unimaginable future? A man who fought with the mind as the men of her own time fought with their hands; living with the continual knowledge that she was more hopelessly inferior to him than the most primitive savage of the twentieth century Earth would be compared to the highest product of the western civilisations. She would never again be able to look at Ted with the same eyes. They had always been equal in everything; at least, she had thought it equality. He had married her under false pretences; had acted a part throughout the whole of their married life. She did not even know his real name, she realised suddenly. A bitter resentment began to flare up in her. When she thought what an open book her mind must have been to him ever since the occasion of their first meeting, a sensation of almost physical sickness overcame her, and she sank her head into her hands with a stifled sob. There was a slight crease between Dinton's brows as he glanced at her. Possibly he grasped the

reason behind at least part of her depression, if she did not.

"Aren't you feeling hungry, Susan?"

She thought about it for a moment. "Not particularly," she answered, indifferently.

"Well, it's long enough since we last ate." He indicated a button on the side wall. "Just press that, will you?"

Susan obeyed with no great show of interest. A panel slid back, revealing a shallow space with a number of flat, square objects within. She took one out and stared at it blankly.

"The top slides off," Dinton told her, still working away at the leads behind the panel, "and mind your fingers—the contents will be hot."

Susan found a tiny catch and removed the lid. The smell of hot food awakened her appetite. She searched in the cavity and found a rather oddly-shaped object resembling a flat spoon.

Although the flavour was new to her, the food was satisfying, as was the coffee-like beverage which she drank later, and as the meal pro-

gressed her point of view shifted. After all, she had lived with Ted in perfect harmony for nearly two years, and he could not be anything else but himself. She was sure of his love, she told herself, and that was all that mattered. She tried to repress the memory of her forebodings.

Dinton replaced the panel, his job finished, and joined her. He tossed the empty containers into a waste trap, and then sat with his eyes on the dials. They were dead; no lights flashed, no blue strip indicated the track they were following through a maze of unknown dimensions. He shrugged.

"Ted," she said, abruptly, "about this war of yours."

There was amusement in the glance he gave her. "What about it?"

She flushed a little.

"Are you reading my thoughts?" she demanded.

"Good Lord!" he laughed. "Is that worrying you? No, Susan, I wouldn't do it. I learned how not to a long time ago. Seriously, what about our war?"

She did not answer at once. Her mind was once more in a whirl.

How many men of her own time, she wondered, would avoid reading a woman's thoughts, given the ability to do so? Yet she remembered that Janton had promised not to do so, and now Ted. Susan realised then that these men were ahead of her own people not only in scientific achievement, but in their social standards as well.

"I've been thinking. It's crazy."

He smiled. "It's crazy, all right. What particular crazy aspect are you thinking of?"

"If you are fighting this war through time as well as space, why didn't you just keep on going back in time a few weeks and attack the enemy before he was ready?"

"Susan, can you see any difference between that and any other surprise attack? It didn't matter what time the fleet set out, if it was to be a surprise attack, did it?"

"N-no, I suppose not," Susan admitted. "But why didn't both sides keep on

going back a little further to retaliate? Or is that an impossible paradox?"

"Susan, there was only one surprise attack like that, and that was the enemy's."

"Why?"

"Because the enemy had set up time-blocks. Both sides did, as a matter of fact."

"Time-blocks?"

"Yes. It amounts to a blockade in time. An etheric vibration broadcast from many planets simultaneously. It is absolutely impossible for any ship to travel through a certain point in time within the limits of this Universe. The effect on the engines is such that the ship would be hurled straight out of our space and time, into the unknown."

"Then how did the first fleet take you by surprise?"

"By slipping into a conterminous universe with a different time-dimension to ours. We did the same when we came back into the past." His face grew grim. "It was pretty hellish; we have never fully mastered the method, and we lost nearly half our ships in transition. But it was

necessary for us to attack in the past, or the enemy's war-potential would have been so colossal that he would have practically won the war with the initial blow."

"So——" Susan's mind groped after the ideas she was trying to seize. "——you came back into the past in order to fight a war which had not yet started. And since the time-block is there in time, you have no chance at all of ever passing back into the future and finding out which side is going to win the war, unless you can get back to your own time the way you came—by slipping into regions of space and time outside our universe."

"That's right," Dinton agreed. "It's all rather chaotic."

"Yes," Susan agreed, dazedly. "Very chaotic. And now we are doing just that—travelling in regions of space and time which are not ours."

"Slipping across them might be more exact. And until we reach a point where the mechanism of the ship can obtain a purchase, we shall continue to slip. Rather as

though we were sliding across a frozen pond."

They lapsed into silence. There was nothing either of them could do about the situation. Much of the time Susan drowsed. She wondered about a number of unresolved factors at times—why it had been necessary for Ted to go back to the twentieth century, for example—but she felt too listless to ask any more questions. She felt herself sliding into apathy—nothing mattered . . .

SUSAN roused herself with a start. It seemed to her that the ship had reeled and twisted in some odd manner. Then as she glanced about her, the control panel came to life.

Every light on the board was flashing, every dial was busy recording chaos, and there were four blue strips with a medley of white dots crossing and criss-crossing in mad confusion. Dinton muttered something indistinctive, and leaped for the panel. She saw his fingers reach towards the buttons. Then everything vanished.

She was at the centre of a

luminous sphere, a white bubble set in the immensity of space. It seemed to her that it was contracting rapidly, and for an instant she had a sickening fear that she would be crushed.

Then the vision was gone, leaving her wondering if she had really seen anything.

She was back again in the cabin. She glanced at the vivid blue strip. The little white dot that represented their position in the infinities was almost motionless. Only one of the four banks of instruments was working. Dinton smiled as he caught her glance.

"We have a long way to go, Susan. And even now I do not know where we are heading, except that it is back to somewhere in our own space—I hope. But just what sector of the continuum is more than I, as yet, can say."

Susan did not answer. For a time she lay and watched the tiny white dot. It was barely moving. From that she knew that their journey would take hours, and she relapsed into a kind of waking dream, where she was once more home, in

the little house which she and Ted had shared for nearly two years . . .

The sound of the door sliding back awakened her. For a moment she lay staring stupidly at the dazzling sunlight which streamed into the cabin, then she heard her husband calling from somewhere outside.

"Susan! We're home."

Still half asleep, she stumbled over to the door, and looked out.

The machine was resting on a lawn that was more grey than green. In the distance white towers thrust up through masses of blue and gold foliage. A white sun stared down at her out of a sky that had a touch of violet about it, and in the opposite quarter of the heavens a monstrous round bulk was visibly rising, thrusting itself up above the horizon, - a world so near that, with the naked eye, she could see the continents and seas through the misty tenuous veil of its atmosphere . . .

Susan leaned against the door frame with a sob. Home!

The word was a mockery. She knew then that home as Ted understood the meaning of the word would never be home to her. She could have made her home with him in China or any other part of the world she knew, but a civilisation so far in advance of hers she could never face. At that moment the beauty of his world meant nothing to her.

THEY stood before the Supervisor in a room within a building that combined austerity with grace, massiveness with beauty. His eyes rested on her for a moment with something of kindness and understanding in them. He waved her to a seat, and turned to Dinton, who remained standing.

Susan felt the echoing commence within her mind, and knew they were in soundless conversation. She leaned back wearily, and closed her eyes.

"Jenryn Dinton, we have read your report. Frankly, I am not pleased with the ease with which the enemy agent Benner, or the man you knew as Benner, succeeded in duping you."

"His mastery over his own mental processes was superb; he deceived us all. I so little realised his true nature that I even staged a demonstration with the force screen in order to discourage him from attempting to force his way through it, which was the thought I read in his mind."

"Doubtless he was a master of mind control." The projected thought had sarcasm in it. "Nevertheless, you should have seen behind his screen and recognised him for what he was. You were sent back in time in order to provide a means of escape for Reyell and Mayina, should they need it. Surely it should have been evident that the enemy would anticipate such action, and place a number of agents at various points. However, the war ended many years ago, and immediately this interview is over you will return to the period following its close in order to resume the normal course of your life within its natural compass. You are not to be punished for a fault that was shared with others."

Dinton bowed his head. "Did any of my comrades

succeed in forcing their way through the time barrier?"

"By machine, none. A few lived through the time-block, in the normal course of events. The block is still there in time, and the past before the war commenced is forever cut off from us. Which brings me to a serious matter. What are we to do with this woman you have brought back with you from the past? The laws of our realm are not to be flouted without very good reason. No immigration in time can be allowed. You came here because you were fortunate enough to reach a point of focus for the various dimensions of the Outer Cosmos, those of our own universe among them. Would you attempt to return this woman to her own time by the same chance that brought her here?"

Dinton was silent.

"I see you care for her, but her mind cannot be left in its present state. With her primitive upbringing she would never know happiness in our civilisation."

"I do not care to tamper with her mind," Jenryn protested.

"There is no need to alter her basic character, but her true memories must be repressed and false ones substituted. Only then will she know peace and settle down in happiness in this time."

"Will she not even then feel inferior? She is no telepath. And she is slighter and smaller than our women."

"She could pass as a woman of our sister planet. They also are non-telepaths, and fairer than we are. They also intermarry with us without shame and reproach, for the offspring are rarely non-telepaths. I say she must be made to remember a childhood and youth on our neighbour world, and to forget that which she has already lived in the past, before the time-block came into existence."

Jenryn bowed his head. "You speak wisely, Supervisor. I have done her great wrong, first in marrying her, and then in allowing her to accompany me on the transporter. But I was anxious to get the message to my comrades, and I had no surety that Benner would not make some mistake. And now it is im-

possible to return her to her own time. If she keeps her true memories she will only grieve over the relations and friends she has left in the past. It shall be as you have said." He turned to his wife. "Susan——"

But Susan, sick and weary at heart, had given up the struggle to resolve her problems, and was asleep.

JENRYN was seeking his wife, if it could be called seeking to search for that which one knows where to find.

He passed down through the little grove of blue flame trees, and so came to their bower. Susan was reclining on a couch, her eyes set pensively on the blue waters of the lake in front of her.

"Are you sad, my dearest?" he asked her.

"Sad, husband?" She raised her eyes to his. "No. But I have had a dream in which I was sad."

"Tell me."

"It seemed to me that I was back in my childhood, on our sister world, and I was happy. Yet it was so unlike

anything I have ever known. The houses were close and petty, with mean little streets and alleys, such as must have been in the days of long ago. And the people I called parents were not my parents, but strangers to me. Yet in my dream I knew them.

"And the world was alone; there was no sister planet, only a dead world that forever circled in the heavens, a world that men had not reached."

There was a shadow in Jenryn's face. "Were you not happy in your dream?"

"At first I was happy, and then I was here in our bower, gazing up at the world of my youth. And it seemed to me in my dream that there was an impassable gulf that would

forever bar the way back to my childhood home. And a desolation came on me, a depth of sadness that I have never known waking."

"And now?" Jenryn's eyes searched her face. "Are you unhappy now?"

"Now, my husband!" Her eyes were lifted to where the misty beauty of the sister planet hung in the violet-tinted sky above. "Why should I be sad? See, my old home is there. I can reach it whenever I wish."

Jenryn bowed his head, and she wondered at the odd sound, half sob and half laugh, which escaped him.

But then Jenryn suffered from the disadvantage of possessing memories which were as they had always been.

Take off your rosy spectacles—

There's trouble in the future!

—says JOHN TAYNE

WHAT are we going to do when coal runs out? Use atomic power? Well, maybe. But this and many similar questions which are not being seriously considered by scientists today are going to cause a lot of headaches for mankind in the future.

Here we are speaking about the dim, distant future, of course—the province of science fiction!—and that is probably why few present-day scientists give the matter any real thought. Though science is quite definitely forward-looking, it tends to take account only of the relatively near future, a few generations ahead at most. But more imaginative minded people cannot help considering the problems that will face humanity, say, several million years in the future. Here are some of the problems.

Medical science, carried to the extreme end of its quest, will dispense with illness and derangements of all kinds; not just bodily diseases, but mental ones as well. So, while the perfect health of the future might not cause unpleasant psychological disturbances, it is pretty certain to produce unmanageable overcrowding.

The sociologists and the better types of politician are trying to get rid of wars. We may presume that they will succeed. In that case, there will not be the periodic decimations of humanity to keep the world's population within economic limits. These two factors—medicine and sociology—working together will destroy the natural balance of life apart from the fairly negligible effects of accident. And even accidents may be entirely eliminated! This way,

people will merely die of old age, whatever that is.

Longevity will be increased so that people will hang around for getting on for a century. Living conditions will be so sweet and nice and secure that people will have no objection to raising large families. The world will be choc-a-bloc with people!

All right, you say, we open up the tracts of land that are now lying useless in Asia, in America, in the frozen lands around the north and south poles. And then, when *they* get too crowded for comfort, we shall be on our way to Mars and Venus, where millions of acres lie waiting for humanity's hordes. Fine! But suppose these two events do not coincide? Suppose that by the time we are treading on each other's toes in every part of the world, we still haven't perfected the means of getting to other planets?—or still haven't mastered the technique of living on them?

If we are all sensible people, you say, we shall not mind living in such close proximity. Maybe you are right, though it still might be said that there

would come a time when, literally, there would not be room to bend down. But that is not the point. The main point is—how are we going to *feed* all these people?

Some economists believe that the root of most present-day troubles in the world is due to the hopeless inadequacy of the present agricultural system. How much worse it will be in the future, with several more billion mouths to feed! It is no use saying that science will find a way of making crops produce more food. Basic thermodynamics tells us that we can get no more out of a plant than we put in. Luckily a lot of what goes in is free—sunlight and carbon dioxide. But no one yet has been able to grow anything in pure water and air, however much sunlight is available—and no one ever will. Hydroponics might help, but *where* are we going to put the vast tanks that would be required? All available land is needed for living space. We shall not be able to open up great mines to get the mineral salts that the plants must have. And even if we could, one

day the mineral supply is going to dry up. And even if it doesn't, are people going to be prepared to grovel about underground in those enlightened, high living days?

Thus, you can see that many of these problems overlap. That is what makes their solution difficult. By solving a particular problem in a particular way, we inevitably create a new problem. Some thinkers, whom ordinary people would call ultrapessimists, believe that every single present-day trend, however superficially noble, is leading to trouble in the future.

Take education. There is a drive on at the moment, more intense than it has been for many years, to "give everyone a good education." On the surface, this seems a good idea. But look around you—how many well-educated people are digging coal, driving trains, sweeping the streets, serving in shops, standing at factory benches, milking cows and planting wheat? None, or very few indeed. It just so happens that—with education as at present conceived—the person who obtains a good education

will not even consider doing one of these rather menial jobs. It is thought by these ultrapessimists that a great deal of labour trouble is going to occur in the future if practically everybody becomes well-educated. Mechanisation does not, and probably cannot, advance quickly enough to eliminate the necessity for people doing mundane work.

Then, harking back to our first sentence, there is the question of the drying up of resources. There is no possible shadow of doubt that the mineral wealth of the Earth is limited. We can go on taking stuff out year after year, century after century, but there will inevitably come a time when there is nothing more—of a particular product, probably; they won't all run out at once—to take out with our marvellous mechanical shovels and astounding robot workmen. Ultraoptimists glibly mutter about atomic energy. The experts are agreed that it is going to be a long time before the energy of atoms can be feasibly used for non-explosive purposes, but let us suppose that eventually

the back room boys make the magic work.

Splendid! We now have an almost unlimited source of energy. But what are we going to do with it? There is no more iron or copper or sulphur or aluminium or silicon or half a million other things in the Earth any more. What is the point of having energy on tap if you've no raw material to which to apply it? Go to Mars, you say, and the Moon and Venus, and maybe some of the moons of the larger planets. All right. But you are only putting it off for a few more million years. Just as the Earth became depleted of its essentials, so the planets will be. What then? The stars?

The stars certainly seem to offer something, but many people are not quite clear just *what* they offer. The stars do not offer an alternative base for humanity—a kind of stellar summer retreat. They offer a chance to keep mankind going when the solar system has been milked dry of everything that is important to man's existence. *The stars are a last retreat.*

Let's go back a bit, to before this startling time when the planets of Sol are pock-marked with the idle mines of departed humanity. We have shown how the present trends in medicine, sociology and education are storing up trouble for our remote descendants. There is also the general trends of politics. We must look at this problem from the point of view of the dim future, and thus will not be concerned with the structure of present-day political systems except insofar as we extrapolate them. When we do this we get a rather startling result. This is that whatever political system we happen to favour right now, we are bound to admit that it leads to trouble in the long run. In other words, scientific analysis of contemporary politics shows that no present system is suitable in a long term view!

This is not really so surprising as it at first seems. We have to remember that contemporary political systems have come into being to deal with contemporary conditions. Even those which are professedly far-sighted are not looking

millions of years into the future.

And the paradox is this: that if one of the present political systems were suddenly to start planning for the remote future of mankind—or if a new system came into existence with that aim—it would be completely useless. Its terms of reference, so to speak, would be based on conditions so far removed from present-day conditions that it would have hardly any points of contact with the world as it is today, and would be quite unable to deal with the problems that face us now.

We seem to be confronted with a problem that is insoluble. It is no good saying that the contemporary political systems will gradually change as the years go by, just as they have changed in the past. We cannot compare the future that we are discussing with the past. Recorded history is but a tiny fraction of the time-span we are considering. Conditions today are not really fundamentally different from those that obtained towards the beginning of man's

rise to the self-annihilating position. Conditions today are different by *degree* only from those of the past. In the future they will be different in *kind*.

By this we mean, for instance, that where minerals are concerned, the present world has *more* available than it had in the past, but that in the remote future it will have *none*. The difference between having a lot and having a little does not have such fundamental consequences as the difference between having some and having none. In one case, your processes are geared to the amount available; in the other case your processes just don't exist!

Every single political system of the present day is based upon the assumption that the raw materials of living will become more and more plentiful. And, of course, that is true—for a limited period. No political system of the present day takes account of the fact that eventually the raw materials of living will be non-existent. Quite properly too. Since all political systems are ultimately related to economics rather than

sociology, and since the economics of the future will be of a different *kind* from the economics of today, then a political system of the future will be of a different *kind* from those existing today. Such a kind is probably something that we just cannot conceive at present.

But one thing is perfectly clear: no matter how clever or how devoted to the well-being of humanity are future politicians, they cannot alter the facts of nature. If there is no more copper or silver or iron in the ground, no amount of clever scheming will put some there. Thus, it may well be that in Earth's remote future there will no longer be any need for political systems—even assuming that there *is* such a need now—for the fundamental function of poli-

tical systems is to arrange for the shifting of raw materials from one place to another with as little trouble as possible from the people who do the job.

So—medicine, sociology, education and politics are leading us towards disaster! These are rather sweeping generalisations, but they have a great deal of truth in them, nevertheless. While the precise predictions made here may not come to pass, there can be no doubt in the minds of anyone who thinks about it sensibly, that the future is far from rosy, and the hydrogen bomb pales to insignificance against some of the problems that are going to face our remote descendants. Aren't we lucky that we won't be here then!

Next month AUTHENTIC brings you a fascinating novel by Tom Carson, *The Tabarni Document*, stories by Harry Warner Jnr., T. D. Hamm, Veronica Welwood. Full supporting features.

AUTHENTIC — A MONTHLY MUST!

*How far should we go in overcoming
human physical limitations?*

This far?

THE MUTILANTS

by R. C. Wingfield

I WENT along to the Establishment for Research into Human Limitations in Flight—more commonly referred to as E.R.H.L.F.—at the suggestion of Doc Le-strange. The Doc has been my adviser for years, and my physician since I was as high as a duck's instep and twice as grubby, and for that reason—and because I was curious about E.R.H.L.F.—I polished my leaky shoes and shaved with a little more care than usual and went along for a job.

Oh yes, I should also mention that I was *out* of a job. And since I am strong on essential honesty today, there is the little matter of nostalgic music. Nostalgic music being, in my case, not the sound of Ava Rhonda's voice or the strains of an oscillaphonic reproduc-

tion of "Ascent to Freedom," but simply the straining shriek of a Superjet streaking down the runway.

At the time I had no idea what Doc's status was at the Establishment, but I did know that he had specialised in brain surgery back in the early fifties, and that he had maintained a position of especial distinction in a London hospital until, in 1968, a mental black-out during a delicate operation cost the patient his life and the Doc his appointment. His resignation was a formality followed by temporary obscurity. Then, during the early part of the Decade of Destruction, he himself underwent a brain operation of a type only twice before attempted—and which had resulted in complete insanity on both occasions.

Doc was fortunate; the operation succeeded and he was pronounced fit to resume his work. In '71 the declaration of war—if seven minutes warning, followed by mass H-bomb raids can be regarded as a “declaration”—dragged him back into circulation as Assistant Chief Brain Butcher, or something of the sort, at Air Ministry, where overstressed and cracked-up aircrews were taken to pieces, examined, and put together again twice nightly and a matinee on Saturdays.

Shortly after this it was considered necessary to establish a centre for advanced research into the very real and increasingly serious problem of man's limitations in flight.

The finest medical intellects were focused upon this project, and Doc Lestrangle became one of the carefully selected and screened inmates of the squat, heavily-guarded compound adjoining Airfield Eight.

I knew little, at that time, of the problems facing these scientists, but I supposed that they would investigate and attempt to overcome the causes

of black-out, red-out, bends, toxic effects, high-altitude fever, speed hypnosis, oxygen saturation and anything else experienced by those who choose to fly high-speed missiles for a living. I imagined that they would minimise the effectiveness of these obstacles to man's conquest of space by more careful aircrew selection, dieting, training, hypnosis, improved methods of assisted respiration, advances in pressure suit design, complete adoption of the prone position in flight, perfection of cabin pressurization and the use of drugs.

As I walked down Superior Hill I could see the aerodrome before me. The main runway swept across the field, clean and white, from a position almost directly below the spot where I now halted. I could feel again the thrill of coming in to land; remember again the virtually obsolete Vampires upon which I trained, and the obsolescent Hunters I flew until the war. I finally joined a Super-Sabre squadron in Kent, spending my brief leaves away from London, where one

was constantly depressed by the sight and stench of bomb-batchy and deformed civilians foraging for scraps of putrid and decomposing food among the rubble. They stumbled in their thousands, with ever-weakening steps, until insanity again fired their despair-dulled eyes and radio-activity burnt them out from the inside.

Ferro-concrete columns sprawled across powdered brick and splintered glass, and gobs of human meat littered Oxford Circus and Sauchiehall Street, and the now barren site of the Tower Ballroom.

Jet engines, designed to run on refined paraffin, were boosted to 30,000 revolutions a minute on liquid oxygen, water injection and hydrogen-peroxide mixtures. If a pilot completed three operational sorties before his engine disintegrated—to smear him across the instrument panel like so much jelly—he was one of the chosen few.

Of the sixteen pilots who greeted me when I joined the squadron, only three were alive two weeks later. I was

one of them and wished to stay that way.

Scared? I should say I was scared. But I loved flying. Have you ever sat up there, above a stretch of white and rose-tinted cloud, beneath a blue dome as limitless as time and vast as infinity itself? Right above the dirt and squallor, the rain and stench and avarice; above the East and the West and money—right way up above Wall Street, Purchase Tax and Parkhurst? Have you ever sat up there, proudly controlling your movement in three dimensions at twelve hundred miles an hour, and then reached the end of the cloud bank—to see a whole continent spread before you like a contour-topograph of itself? Have you sat high in the troposphere, listening to the thousand-mile-an-hour whistle of air streaming thinly over the plastiglass canopy, and seen a silver-grey speck grow out of the distance until, within the space of seconds, it has become a magical, slender and beautifully streamlined ship glinting in the clear sunshine of outer atmosphere,

at formation station three feet from your own wingtip?

And when it is there, floating as though in suspended levitation, you marvel at its complexity and at the power beneath its deceptively slim nacelles. A flying machine capable of speeds limited only by the friction barrier; a recording instrument capable of computing a hundred items of meteorological knowledge—from barometric pressure to the ratio of oxygen to nitrogen in the area through which it is passing—and of transforming them into mechanical energy capable of applying instant compensation without the pilot having to lift a finger; a machine capable of sustained flight in any weather or in total darkness; a flying searchlight, a broadcasting and receiving station, and a flying gun platform all in one—that is what you see trembling at your wingtip as pockets slip over its control surfaces. Its pilot never takes his eyes from your wingtip, except for briefly snatched glances at his instrument panel—until you signal the break. Then he lifts a gauntlet-clad hand

and grins. His booster apertures belch shimmering heat. The nose lifts and the machine hurtles away with blue-white pinpoints of flame spearing the air behind it. With your own velocimeter showing nine hundred, still it streaks away from you. Diminishing in a matter of seconds to first a speck and then an unbelievable dream.

With sudden pride you realise that his machine and your own are the same, and that he is not a god, but a man—like yourself. You are both members of the same breed; the soft, pulpy, ill-equipped predecessors of what? Who raised themselves from the slime and became lords of earth—and who are still evolving; but oh, how slowly . . .

In sudden respect and affection you run your hand over the smooth belinium surface of the control column and open the taps. The burble from behind becomes a vibrant hum and you feel yourself pressed against the back of the seat as she surges forwards and upwards. Scared? Of course we were scared, some-

times, but how can you ever forget flying?

More pilots came, more were killed, and we knew the fear that dries up your mouth like blotting paper, that makes your hands run ahead of your brain, and that opens every sweat-producing pore of your body. They issued narcotics, spirits, rubber bottles. Still we climbed up and vanished, sometimes for ever, behind tumbling cumulous cloud.

Finally, I bought it too. I ejected myself from a blazing Vituper with disintegrated impellers and bursting hydrogen all about me. The separator-gear failed to operate, and instead of leaving the ejector seat I went hurtling down with it. Our arrival made a noticeable impression on the surface of the earth—and I never flew again.

Later I left the Service. I sold cans of oil, worked in a factory, drove a lorry. People were starving and I was "people." I was not in very good shape, and when I bumped into Doc Lestrangle, and told him how bad things were and how much I missed flying, he glanced me over.

To my great surprise the Doc pronounced me fit and sent me along to E.R.H.L.F. "Tell Doctor Kersch that I sent you," he reminded me, "and that I regard you as fit and eminently suitable for advanced flying."

So there I was, walking down Superior Hill with hope in my heart, my heart in my mouth, and nothing in my stomach, feeling again the trembly thrill of bringing a high-speed fighting machine in to land. I stopped, hearing suddenly the high-pitched whine of a Superjet winding up. Then I saw the glint of light on its cowlings as it topped the ramp from its underground hangar. It slid smoothly out of the flat mouth and gained strip level, accelerated rapidly towards take-off point. Belly hugging the ground, light glinting on plastiglass, and undergear telescoping as its nose dipped with the brakes, it looked a typical Superjet. Shrilly the boosters fired. It shot forward at twenty, fifty, two hundred, seven hundred miles per hour; shrieking, hurtling, boring

skyward almost vertically, directed now straight at heaven and already a mere point of light.

For a moment I was too thrilled to move, then a cold finger of doubt traced a path through my unconscious to my conscious mind. Could the human frame stand such violent acceleration—even at E.R.H.L.F.? Was it a pilot I had seen beneath the plastic-glass canopy, or was it a robot? And if a robot, why have a canopy instead of a simple telelens in the nose? I pondered this. Then, shrugging the question aside, I carried on down the hill until I could no longer see the strip for buildings, and ahead of me the scene was entirely dominated by a row of squat and windowless huts surrounding the research centre terminal block.

I was stopped at the entrance gates, questioned, told to wait. For ten minutes I tried not to chew my nails, while messages were passed back and forth by telephone from the guardhouse. Then I was taken through these outer gates and given a seat in the guardhouse

while the inner gates were opened. A uniformed guard approached, nodded for me to follow. I did so and we made our way to the terminal block.

In there, Doctor Kersch's office was soon reached. As I stood outside, waiting, I moistened my lips and tried to work up an interest in a row of multi-dimensional photographs mounted behind plastic sheeting on the walls. The building was old, the plastic sheet—obviously synthetic resin—had scarred and misted over, and the phenolic resin frames had faded and become distorted as a result of moisture absorption. But there was nothing old about Kersch's office.

The door slid back so quietly that I felt suddenly naked. I saw Kersch looking at me, and felt my enthusiasm fade. Then he smiled. I experienced a sudden upsurge of relieved emotion; trust, hope, admiration. Kersch motioned me in, permitted the smile to remain on his lips for a brief moment. I saw before me a scientist too preoccupied to bother about the platitudes of

formal introduction. He was placid in his disregard for the conventional smile or the blatant manifestations of trained courtesy.

"Your documents," he said, quietly. He tapped a pile of papers with his forefinger. "Forty-three hundred hours air experience as a pilot. Mostly on fighter aircraft. Flown Vampires Mark Three and Five, Venoms and Vitupers. Meteors Mark Four, Seven, Eight and Fifteen. Hunter. H.1091. Sabre and Supersabre . . ." He nodded with apparent satisfaction.

"My age?" I asked. "Am I . . .?"

"Nonsense, nonsense. You're good for years yet." He walked round the desk and sat facing me. "If Doctor Lestrangle recommended you, I am satisfied. Your medical history is good. Records rate your standard of moral courage as very high. Men of your experience are required. We have aircraft that ordinary men are incapable of flying."

For a moment Kersch looked into my soul. "You are capable of flying such machines," he told me. "You

are old in experience but young in your reactions. You are capable of a great hatred for our enemies, and you love the element that only your breed has conquered. Would you like to see one of our crew rooms—and those who people it?"

I nodded with enthusiasm. Pilots in their crew room are pilots in their noisiest, rowdiest state of relaxation. Eagerly I anticipated a cheerful half hour of swapping lines with a companionable bunch of my own kind once again; a half hour among those sportsmen who were chosen for their own peculiar brand of temperament; a mixture of dash and judgment, impetuous bravery and caution, irresponsible blindness matched by superb co-ordination and intuition.

My mind flashed back over a hundred happy crew-room incidents; fire extinguishers "accidentally" set off, wall charts and pompous S.R.Os. "inadvertently" set alight, pyrotechnics exploded mysteriously beneath the chairs of "binders," a book called "Teach Yourself to be a

Pilot" placed in a conspicuous position on the Flight Commander's desk. It would be good to see some of "the boys" again.

I smiled at Kersch and he looked back with a similar enthusiasm alight in the depths of his own eyes. We stepped into the elevator and sank rapidly. Compressed air hissed and light flickered through the air vents as floor after floor shot away from us. We must have been seven floors below ground level—to my surprise—when the cubicle slowed to an almost imperceptible halt. Another pneumatic whisper, and the doors slid silently open on curved runners. Ahead, there was a long, dimly illuminated passage lined on both sides with steel doors. It was deathly silent, and again I felt my enthusiasm chill and seep away from me.

I looked at Kersch. He was trembling slightly, as though the cold were too much for him, and his face looked strangely intense. Embarrassed by the absolute silence, I coughed. The sound echoed and re-echoed back and forth

along the corridor, gaining a metallic ring as it aged. We walked. Our footsteps rang through the passage, making me feel out of step as the cadence multiplied and multiplied again, until it sounded as though an army of ghosts were behind us.

Suddenly Kersch stopped. He turned to a door on our right and I noticed an illuminated chart at its side. The door was marked "J8" and was heavily rivetted. I saw his eyes flicker over the chart. He said: "Number Seven is airborne. That would be the Superjet that took off as you arrived. He is due back in four minutes."

I felt my mouth open. "That really was piloted by a man, then! But . . . but . . ."

"Number Seven would be gratified, indeed," Kersch said. The muscles in his jaw twitched. "Let us go inside; you will be able to greet him on his return to the comforts of the crew room." He pressed a button and the twin doors opened with rather more noise than had his office doors.

For a minute I was quite unable to accustom myself to

the semi-darkness; so I closed my eyes and waited, hearing nothing but the rustle of air from the lift shaft and corridor as it entered the crew room. Silence. I blinked, adjusted my pupils and saw before me a long, steel-lined room, lighted by concealed strip giving off an unearthly greenish glow. As my eyes finally accustomed themselves, I saw before me, growing out of the foggy void, a scene of such unutterable horror that I whimpered in fear for my sanity.

"My dear fellow," Kersch was murmuring, "there is really no cause for alarm. Calm yourself, please."

Speechless, I stared at the hellish spectacle. Row upon row of polished alloy tubes ran the length of the steel cavern. Five or six feet from the floor, these tubes curved away to sliding doors at the far end. There were perhaps thirty, and of these only one was vacant. It was marked at this end by a faintly illuminated plate bearing the figure seven.

Suspended from the other rails, and swaying gently in

the light rush of air from our door, were a score or so objects from a lunatic's nightmare. Near-human, with stumps for legs, and each with only one arm, these devilishly mutilated creatures stared mindlessly out of drugged eyes set in scarred and blood-drained tissue. They were alive, even alert, but their seamed and twisted features showed little sign of emotion beyond that of . . . of what? Hatred, I decided later. Not the fundamental, emotional hatred of man, but the cold, deadly hatred of a snake, perhaps; a trained, hypno-induced hatred; a suspended emotion nurtured, sharpened, concentrated and then carefully turned in a required direction while held in boiling, simmering check. All hell's fury waited there for release.

Horrible, more horrible even than the mass amputations and the deathly emptiness of those eyes were the twisted and broken necks. Exactly alike, each head grew forward from a deformed chest, and from the crown of each head there arose a raw and hairless thing; a filthy,

loathsome growth of red-soaked flesh, terminating at the top in what appeared to be a neat, plastic screw-cap. Untended hair straggled over each short neck to a hunched back, and buried in the gristly pad of this warped hump there was a silver hook, providing a method of suspension for each fearful object from its rail.

"Our crew room," Kersch murmured, conversationally. As he spoke the room brightened momentarily with the opening of a door at the far end. A faint rumbling disturbed the sudden hush, and through the green mist of the dispensers, through the semi-darkness of this nightmare building, there came towards us a glistening, sweat-soaked object of deathly pallor and horrifying aspect. Tinted by the lighting to a ghoulis green, it advanced. Drawn by electro-magnets along its alloy rail, it settled, loosely swaying, with eyes closed and intense agony clearly expressed upon haggard flesh, beneath the plate marked seven.

"Would you care to watch them have their protein in-

jections?" Kersch asked, suavely. "Or do you prefer to absorb a little nourishment yourself?"

Looking at him as he spoke casually of food, I began to feel physically sick. The room was swimming before me. I couldn't keep my mind from the blazing hydrogen and the agony of my first weeks in hospital. I felt faint, sick, empty.

"Inhuman," I managed to gasp at last. "I never knew . . . would never have believed . . . in *England!*"

With a casual movement of his meticulously manicured hand he silenced me. "My dear fellow, you allow emotion to overshadow logic. Think of it like this; in a month you lost how many Sabre pilots during the early part of the war? Twenty on your squadron? Thirty? More? And why did you lose them, eh? *Not* because our scientists lacked the technical knowledge required to produce unbeatable projectiles, but because they ignored the weaknesses of man. We were beaten by ourselves. Machines advanced but man remained

physically unchanged. If anything, man deteriorated. Physically he is inferior to his Neolithic forefathers. From the morphological viewpoint, the squat ape is infinitely better equipped to fly an aircraft than any man alive. The comparison shows man most unfavourably, I assure you, and tests have proved that the common housefly is capable of withstanding double the centrifugal stresses fatal to man. Man's circulation is poor, the distance between heart and brain being too great. The respiratory system . . ." He snapped his fingers before my eyes, but I was too weakened by nausea and apathy even to blink. ". . . quite hopeless." He continued: "Totally inefficient. And still machines advance. Human flight limitations, having at last been recognised as a major problem, are given precedence over all else in high military circles, and for that reason this research centre exists." Kersch stared at me, eyes alight with crazy enthusiasm. "The Mutilants you have just seen are merely the initial diffident step

towards total conquest of space; the crude result of our earliest, blind gropings—but the experiment was a success. We have progressed far, my friend, since their metamorphoses."

Looking with fear at his burning eyes, I recognised stark insanity. Get out of here, I told myself. Humour him, do whatever he asks, but get out of this slaughterhouse. Trying to sound unintelligently interested, I asked: "But how does it help to have cripples . . . ?"

"Cripples!" Kersch looked at me with an expression of scorn and impatience. "In terms of scientific usefulness, those Mutilants are infinitely superior to you or me. They are the simple result of a few surgical operations. Removed limbs improve circulation, and the weight reduction enables designers to reduce the lift area of an aircraft by several square feet. Limbs, you know, are quite heavy. Also the neck was broken and the head lowered until on a relatively mutual plane with the heart and lungs. This enabled the blood to feed both brain and

eyes under quite severe conditions of positive or negative acceleration, rapid change of direction and so on, and when later we fitted the blood reservoir—you will have noticed the protuberant object grafted on each Mutilant's head—we found the blood pressure at the nerve centres to be improved to such an extent that most Mutilants remained conscious while thirty gs were imposed for sustained periods of time. An unmodified human would black out, and probably pass out, under the strain of fourteen gs imposed for only a few brief seconds."

Kersch nodded with complaisance. "The blood reservoir, jocularly referred to as the 'header-tank' or 'gristle-graft' by many of my staff, was entirely my own innovation. Only the Mark III Mutilants have it so far, and it weighs less when full—with a half litre of blood—than a third of the average weight of the left arm that we usually amputate and discard. The unsatisfactory prone position can now be abandoned, the fuselage can be slenderized,

and, of course, safety equipment is thrown overboard with the legs."

I swayed. "N . . . no parachute?"

"A man fights best when the alternative is certain extinction. Safety devices tempt only the morally weak."

"But . . . but this blood tank. It's revolting . . ." I stopped myself in time, but Kersch seemed oblivious.

He was saying: "Yes, ah yes. Plastic gristle, to put it in the layman's jargon, directly above the brain. When gs are applied, the blood drains *from* the upper parts of the body in an unmodified human; blood drains from the tank *to* the upper parts of the Mutilant's body. It has a sealed screw cap of rigid P.V.C. at the top, and this can be removed for purposes of transfusion after heavy blood losses. We top them up, so to speak. The graft rather detracts from the subject's appearance, but by then he is invariably beyond caring about such trivialities as personal attractiveness."

Kersch laughed dryly. "That brings us to the more

difficult aspect of human modification: the emotional complications that follow. Do you know," he said, "that most subjects view modification not only with distaste, but with fear and horror—simply because it precludes sex relationship from their future activities? This emotion is so strong, stemming as it does from the philoprogenitive instinct necessary for *racial* or *special* preservation—and self-preservation is simply a projection of that—so strong, I repeat, that we found not a single true volunteer for the Mark IV modifications!"

"Didn't you?" I muttered, weakly.

"No, simply because it involved a neuterisation of the sex hormones. And do you know how I obviated this mental resistance?"

I shook my head from side to side, side to side, side to side . . . The rushing noises of unconsciousness were descending upon me. I was about to faint, I told myself, and groped blindly for support.

Thinly, as though from a distant point within a vast

and hollow cave, I heard Kersch reply to my head-shaking. "By hypnosis, of course. In this way the subject is not actually *forced* to undergo the operations. He volunteers, under hypnotic pressure, and later feels no resentment against myself or the other surgeons. *We* tell him whom to resent."

As I sagged back against the wall, Kersch lowered me gently to something—I don't remember what—and the hopeless, sickly trembling of faintness gave way to a feeling of relief that I was past resistance and now the responsibility of another and more capable mind.

"This is where I am invaluable," he was saying, gently. "The patient trusts me, and, I being a surgeon as well as a hypnotist, it is possible to maintain the subject in a state of submission throughout the whole of a series of major operations. When the trance effect is removed, and the patient sees for the first time what has been done to him, he sometimes dies of shock. We are reducing the mortality rate by more

gradual de-trancing, as it were, and the subject is given more time to grasp the unpleasant truth and to comprehend the effect it must have upon his now reduced expectation of life. Naturally, he is appalled at what he learns. He is literally gruesome to behold. Every emotion turns to hatred and bitterness. Then we focus that hatred upon our enemies, de-sex the subject, store him in one of the crew-rooms in a drug-induced coma until such time as he is required for flying, and give him a number. It is really only military service taken a step further. The inoculations and drug tests, the blind obedience to unreasonable commands, the guinea-pig gas researchers, the suicidal duties—remember? That, my dear fellow, is as far as we had got two years ago. I expect you wonder how far we have got now!"

"Nghhh," I said. His eyes fascinated me. "Nghh . . . now . . . nnnnow?"

"Ah, *now*," Kersch repeated. "*Now* we are about to produce the Mark XV Mutilant. It will be many stages

beyond what you have seen today, and we anticipate for it complete freedom from blackout at over sixty gs. The thing—one can hardly give it human identity—will be in constant agony, I am afraid, as a result of the eighty-three surgical operations that must be performed upon it, and its carefully directed hatred will exceed in concentrated intensity any emotion ever before contained by a single, human mind. The operations involve removal of all redundant tissue and of unnecessary bone and muscle; the shortening and by-passing of arteries and veins. Digestive organs are discarded, and therapy, together with fluid injection, will replace pre-transmogrification methods of energy intake. I tell you, not only will the Mark XV Mutilant mark the beginning of a new, surgically evolved race, but he will be scarcely recognisable as a humanoid at all."

His eyes ablaze now with fanaticism, Kersch could hardly control the twitching of his face. "We are about to begin on him now," he whis-

pered, and as the full import of his words permeated my numbed senses I realised that I had left the struggle too late. I felt my stomach-muscles collapse with fear, felt the blood pound within my temples. I wanted to retch up my guts in the cold, fresh air. I wanted to lie in the soft grass and see a pastel sky above me. Instead, I saw his eyes burning through the red haze into my retreating mind; probing, feeling, directing; expanding, multiplying . . .

I felt myself ascending. Up, up through the dark roots of cumulus clouds; up through the tendrils of swirling mist and grey-white dampness; up, up, up through lessening strata of semi-darkness and suddenly, unexpectedly, into an area of intense and blinding light. I felt the blast of heat, heard the roar. Struggling to release myself from the ejector seat, I tore with frantic, searching hands at its frame to which I was strapped. Blood ran in my mouth and I passed out again . . . I tried to shut off the power before the turbines burst. The control

lever was gone but the machine continued to strain upwards, accelerating at a terrifying pace, and I waited with every nerve taut for the sudden explosion of the impellers. The machine seemed to roll on its back and begin to tumble into the dark void below. Back into the abyss; the hiatus of experiences remembered only by the dead.

Again she climbed. I felt for the control column. It was no longer there. "Gone!" I shouted, and through the cotton-wool layers of unconsciousness I heard a voice answer. My eyes fought for vision. My agony-racked body strived for the energy to lift eyelids sealed with blood. Merciless pain; the burning from within—wasn't that the effect of radioactivity? My eyes flickered open, and instead of the blue-white sky they saw the opalescent glow of a hospital ceiling and the face of an old man looking impassively down.

"Doc," I whispered. "D . . . did I faint?"

The face registered no concern and made no reply.

"I . . . I was dreaming.

Flying, and the stick got shot away." I felt the beginnings of relief—then memory flooded back and I struggled to arise. My limbs were strapped at my sides. Strapped! I tried to see if they were strapped—or missing. "Did I faint? Is it a nightmare, tell me?"

Doc Lestrangle shook his head. "You must relax until Doctor Kersch is ready for you . . ."

"Kersch!" I interrupted. "You don't mean . . . you can't . . ."

The Doctor nodded slowly. "These things are as necessary as any other form of military preparedness or medical research. As necessary as vivisection. Relax, you are almost ready for the brain-wash and final hypnosis."

I struggled madly. "Brain-wash! You haven't made me . . ."

The Doctor nodded slowly, and I thought I saw him brush aside a threatening human emotion that was softening his features.

"Relax," he ordered in a firm and impersonal voice. "Do not attempt to look beneath the screen until you are told to do so. You are receiving high-frequency radio therapy and in a matter of hours your skin will have healed over. You will be given massage immediately prior to hypnosis. After that the pain will diminish considerably. Hail progress!"

"For God's sake tell me—*what* am I? Am I . . .?"

The Doctor nodded. "Mark XV," he said.

LOGIC IS FUN—3

by FRANK WILSON, B.Sc.

THIS MONTH, now that we have laid the groundwork of rational thought processes, we shall take a look at the forms of argument that play an essential part in the advance of science. One form of argument is the categorical syllogism—an Aristotelian device that does not have a very important role in present-day scientific thinking.

A categorical syllogism has three categorical propositions; two of them are *premisses*, one is the *conclusion*. Consider the following: "All rockets are capable of working in space. All V2's are rockets. Therefore, all V2's are capable of working in space." The first sentence is the *major* premiss, the second sentence is the *minor* premiss, and the third is the conclusion. All three are universal affirmative propositions.

You will remember that there are four types of categorical proposition: universal

affirmative—all S is P; particular affirmative—Some S is P; universal negative—No S is P; and particular negative—some S is not P. Now, obviously, we could combine any of these types in all sorts of ways. But it is important to remember that only certain combinations are valid, *i.e.*, only with a limited number of combinations does the conclusion necessarily follow from the premisses.

Since I am not here trying to teach you logic, but only to show you what logic is about, I don't want to dwell on the categorical syllogism, which is mainly only of historical interest for all except serious students of logic. If any readers want to know more about them, I shall be pleased to answer any queries addressed to me, care of the Editor.

A much more important form of argument is the hypo-

thetical syllogism. Here is an example of such a one: "If people can guess what is in other people's minds, then telepathy is real. People *can* guess what is in other people's minds, therefore telepathy is real." You will see that the major premiss is an "If . . . then . . ." proposition (hypothetical or implicative), the minor premiss is a categorical proposition, and so is the conclusion. The simple proposition that follows the "if" is called the *antecedent* and the one which follows the "then" is called the *consequent*.

Don't make the mistake of thinking that this is trivial, for, though the subject matter may not be important, the *form* of the argument is identical with that used in all branches of scientific research. It is the deductive basis of the putting forward of a hypothesis and the testing of it—a method without which science could hardly progress at all. A hypothesis is put forward, then the scientist tests the truth, either of the

antecedent or of the consequent, and thereby deduces the truth or falsity of the other member.

But it is essential to realise that a valid deduction follows only from affirmation of the antecedent or denial of the consequent. Nothing can be deduced by denying the antecedent or affirming the consequent. Concretely, in the example given we cannot deduce that telepathy is *not* real by showing that people *cannot* guess what is in other people's minds. Even more strangely to the lay mind, we cannot deduce that people can guess what is in other people's minds by showing that telepathy is real. Though all your instincts may be against this, yet it is logically true.

Putting all this into shorthand, merely so that we use less space, we symbolise the syllogisms thus:

$$\begin{array}{ll} p \supset q, & p \supset q, \\ p, & \sim q, \\ \therefore q. & \therefore \sim p. \end{array}$$

where \supset means "implies,"

\sim means "not," and p and q are simple propositions. These are the only two valid hypothetical arguments, though they have equivalents in other forms as we shall show later. If we argue as follows—and many people do!—we are being illogical:

$$\begin{array}{ll} p \supset q, & p \supset q, \\ \sim p, & q, \\ \therefore \sim q & \therefore p. \end{array}$$

Concrete examples of these invalid forms are: "If rockets push against air, then they need oxygen. Rockets do not push against air, therefore, they do not need oxygen" (they may need oxygen for fuel); "If the Moon is new, then it is invisible. The Moon is invisible, therefore, it is new" (perhaps fog is obscuring it).

Another important form of argument somewhat similar to the hypothetical syllogism is the alternative syllogism. You will remember that an alternative proposition takes the form "Either . . . or . . ." (symbolised by $p \vee q$). And you will remember that the

alternative proposition means that one, at least, of the two simple propositions must be true, leaving it an open question as to whether they are both true. A familiar example is "Either you believe in flying saucers or you claim they are terrestrial objects."

Now in the alternative syllogism there is an alternative proposition as major premiss and two categorical propositions as minor premiss and conclusion. Using the above example as a major premiss, we could set up this syllogism: "Either you believe in flying saucers or you claim they are terrestrial objects. You do not claim they are terrestrial objects, therefore you believe in flying saucers."

A valid syllogism results when either of the alternants is *denied*. Nothing can be deduced by affirming one of the alternants, because as we have said, *both* alternants may be true. From the *form* of the argument, irrespective of what the argument is about,

only the following syllogisms are valid:

$$\begin{array}{ll} p \vee q, & p \vee q, \\ \vee p, & \vee q, \\ \therefore q, & \therefore p. \end{array}$$

Notice that it does not matter whether the p or the q is the minor premiss. This is because " $p \vee q$ " means the same thing as " $q \vee p$." Whereas " $p \supset q$ " does *not* mean the same thing as " $q \supset p$."

The alternative syllogism is greatly used in scientific research as a means of eliminating suggested explanations and solutions of problems. If the suggested explanations can be put together to form an alternative proposition, then one of them shown to be false, the truth of the other follows automatically. For example, we may assert that either evolution is caused by inherited features or it is caused by acquired characteristics. If we can prove that evolution is *not* caused by acquired characteristics, then it follows that evolution is caused by inherited features—that is, so long as one accepts

the truth of the original premiss.

You will now see clearly why we cannot deduce anything by affirming one of the alternants. Even if we are able to prove that evolution is caused by inherited features, we are not justified in claiming that acquired characteristics is not also a cause.

But you will agree that it would be useful to be able to do that—to show that if something *is* so, then something else is not. Obliginglly, the logician provides you with yet another form of syllogism to meet this need! It is the disjunctive syllogism.

You will remember that a disjunctive proposition is of the form "Not both p and q " (symbolised by $\vee(p . q)$). Such a proposition states that both of these simple propositions cannot be true together; one of them must be false and maybe both of them are false. A disjunctive syllogism has a disjunctive proposition as major premiss and two cate-

gorical propositions for minor premiss and conclusion.

From childhood you have been familiar with the remark: "You cannot have your cake and eat it." This is a disjunctive proposition! It says that you could keep your cake, or you could eat it, but not both—and it does not say that you will be given the choice; it does not say that there is any cake, anyway!

Putting this into a syllogism, we can get: "It is not the case that you can both keep your cake and eat it. You keep your cake, therefore you do not eat it." It could also be the other way round, of course. Then the minor premiss and conclusion would be: "You eat your cake, therefore you do not keep it."

Notice that valid deductions follow only when one of the disjuncts is affirmed. We can conclude nothing by denying one of them. If we said that "you do not keep your cake" we cannot infer that you eat it, for you might give it away or

burn it, or do something else equally silly!

Taking a less trivial example, and one which has actually been used in astronomy, we can set up the syllogism: "It is not the case both that the Moon has an atmosphere and that it presents a distinct edge. The Moon presents a distinct edge, therefore it has no atmosphere." A very great many scientific ideas have been put on a firm basis by means of such arguments. Again, of course, the argument does not prove that it is *true* that the Moon has no atmosphere, but only that this is true *if* the premisses are true. Someone may come along one day, with a more delicate instrument, say, and demonstrate that the Moon does not present an absolutely distinct edge. Then we cannot continue to believe in the argument, because one of its premisses is false. This does not mean that the conclusion is necessarily false; it means that we just do not know, from this

argument, whether it is true or false. We have to start thinking again—and this is where *equivalence* comes in.

The three forms of argument that we have considered here each have their own special application to scientific method. And they are interconvertible. This means that if our data gives us an argument in one form, and that form is not the one which is most useful for our purpose, we can convert it into an equivalent form that *does* suit our purpose.

You will probably have to do a certain amount of hard thinking now! I want you to see why it is that some forms are equivalent to others, because therein lies the whole deductive basis of scientific research. Ready?

When we say "If p , then q " we might just as well say "Either not- p or q ," or "Not both p and not- q ." Do you see that if it is true to say that q is implied by p , then either

not- p or q must be true, and that p and not- q cannot both be true? Perhaps you will better be able to see this equivalents if we set it out symbolically, so that you can take it in at a glance. We'll show the interconvertibility of syllogisms, the major premisses of which are all equivalent to each other:

$$\begin{array}{lll} p \supset q, & \neg p \vee q, & \neg(p \cdot \neg q), \\ p, & \neg \neg p, & p, \\ \therefore q. & \therefore q. & \therefore \neg \neg q. \end{array}$$

(note that by denying a negation we make an affirmative. Thus, $\neg \neg q$ means q . "Not not hot" means "hot.")

See if you can make up examples for yourselves and express them in the different forms. It is quite easy, really. You could take the "Moon" syllogism to start with.

Now we have covered, very lightly, most of what is involved in "traditional" logic. Next month we shall go on to some more modern ideas and deal with relational arguments—all about loves and hates!

He didn't ask for much. Just the power

TO SHAKE THE STARS

by PETER GREEN

"ORFIE!" They'd shouted after him, slinking along the passage leading away from Prep Room. "Orfie! Come on, fellows! Scrag him!"

He'd run then. Run on thin, agile legs and the hatred and loathing and pity for the boys behind him was all mixed up with his own contempt. He'd run until the blood pulsed thunderingly in his ears from his kicking heart, like a mouse scrabbling frantically behind the wainscotting.

They'd caught him. Two husky fifteen-year-olds, springing, whooping like hounds, from a side-passage. He could smell the clean, scrubbed, carbolic soap smell of them. He felt their raw, redly bare knees gouging him. Their quick, nervous, excited gig-

gling came over the sound of their blows.

Oh, it was fun!

"Bright boy!" someone screeched in his ear.

"Teacher's pet!"

"Scrag him! Scrag him!" they all chorused.

"Hold onto him, you idiots! Don't let perfect little Orfie get away!"

Marshal's voice. Deep, broken this term. Marshal, prefect and perfect bully. He hated Marshal! The big, freckled hand that could push a tackling forward away with such ease twisted now in his collar. His tie dragged under his ear.

His school tie. He'd been proud of that. Once. Before he'd found out what devils ordinary, unthinking, uncaring schoolboys could be.

He lashed out then with his feet. Rules? Don't worry about rules. Get away! Hide! He ached for a damp, warmly dark hole in the rich brown earth where he could crawl and curl up and forget.

His feet sharp on shins. Yells. Orders and counter orders.

"Hold on, Marshal!"

"Oh. My legs!"

"Let the little blighter go. We can always catch him again."

The corridor, long and cool, the tiles a clean quick pain of ice against his fevered forehead.

Quietness. The Head's door. A knock, timid, fearful, defiant.

"Come in."

A deep carpet, a desk that was as high as a mountain and as darkly brown as the oaks in the quad.

"Ah, Brown, stand there, lad. And what's been happening to you, eh? Speak up! Speak up!"

"Nothing, sir." The carpet, the red threads running over the blue, and the black jumping in and out like a cat.

"Nothing? Well, then,

straighten your tie. And tell Matron to look at that black eye."

"Yes, sir. Thank you, sir."

"Now, Brown," briskly.

"You haven't been very happy at school, have you?" The Head's deep-set eyes piercing him through pince-nez. A quizzical, sympathetic look that opened arms of comfort to him, arms which he resolutely refused to accept. He searched the Head's lined face for a sympathy he did not want to find, an understanding that would expose his own weakness.

"I get along all right, sir."

"Well now. That's good. Fine. I asked you in, Brown, to tell you that I expect an extra specially good result in the exams. tomorrow." The Head fidgeted with important-looking papers, his hands like the claws of a mystic, preparing a sacrifice for the flames.

"I've heard the boys calling you a name, haven't I, Brown? D'you remember what that was?"

Did he remember?

Orfie.

Would he ever forget?

"I—I don't know, sir."

"Try, Brown. Tell me. What do the other boys call you?"

"I can't." He traced the pattern on the carpet with his toe, pointed like a ballet dancer's, following that jump and burrowing of the black threads.

The Head rustled his papers and swallowed.

"Isn't it—Orfie?" he asked, gently.

"Yes, sir."

"Well. That isn't so bad, is it? I remember when you first came here, Brown. You were not much smaller then than you are now. You haven't grown much, have you, in eight years? Well, never mind."

Never mind. He'd told himself that ever since the others began to grow away from him. He'd told it to himself night after night, sleepless and miserable in the silent indifference of the moonlit dorm.

"Your record shows that you want to be a rocket pilot." The Head put his palms together as though he were all alone in a great cathedral. "You want to see the wonders of space. Being small might be

an advantage there, Brown."

"I hope so, sir."

"You're not the only orphan here, boy. Why don't the boys call those other orphans 'Orfie'?"

"I don't know, sir."

"Well, think about it, Brown." The Head took a cigar from a humidor and lit it with relish. The cigar was like the ships that plied the Deneb run. Long, sleek and fast in the interstellar emptiness.

"You've been doing very well here, Brown. Very well indeed. I had high hopes that you would prove to be our star pupil."

"Thank you, sir."

"Ah, but, Brown." The Head waved the cigar and his wrinkled, kindly face creased around the eyes. "You've been backsliding these last couple of months. Quite unlike you. What's been the trouble?" The question came out sharp and bright, and unanswerable, like an executioner's sword.

He shuffled his feet, seeing his shoes dusty, with small brown rips in them where they played football with stones. His hands were wet. He licked his lips.

The Head looked at his face, and took to puffing his cigar fiercely so that great clouds of sweet-smelling smoke filled the low room and smoked against the panelling.

"Never mind, Brown. Just remember, tomorrow is finals day. And I want you to do well."

"I'll try, sir. All the others, their mothers and fathers—that is—if you want me to try, sir, I will."

He picked up the large, official envelope with the red seals and wide blue pencil marks which made it look like the lid of a chocolate box. He sat for a moment, holding it in his hand. Then he put it down again. His sigh almost died in the room, but Orfie heard most of the words, and did not understand them.

"If only they'd thought more—if only I'd known."

He waited there, small in the middle of the room before the great desk that was like the judgment desk of Solomon. The Head coughed and took the rocket from his mouth.

"All right, Brown. You can run along now. But, remember." The Head's words

went through him like sleet tearing down a spider's web.

"Try your very best tomorrow. For me. And for yourself. And—for the stars."

"Yes, sir."

The door closed behind him. He walked down the passage. Already evening shadows were rustling in over the quadrangle, enfolding the oaks, and pieces of the shadows flew up in sing-song notes as the birds found their nests.

He was very quiet that evening. But he had always been quiet, almost, it might have seemed, as though he were trying to remember a mother and father he had never known. He had come to the college when he was six, and now he was fourteen, and he could remember nothing of any life before this. Life had begun for him here, in the college, with the other happy, laughing members of families, boys.

And he wanted to be a rocket pilot!

It was so funny it made him want to cry.

His thin arms and legs, and pale, shining, almost death-lily features, out there in the cold, tough, blustering wild-

ness of space? It was really very funny. When you thought about it.

And Orfie did. All the time.

He was pulling the cool, ascetic sheets around his neck in the shadows of the dormitory, when Marshal glided to his bed and sat on his chest.

"Wake up, Orfie! You're not asleep yet!"

He snored.

Marshal dug a cruel, sharp thumb into his bicep. His eyes flew open. He gasped with the pain. Tears scalded his eyes.

"Listen, Orfie. Remember what I told you?"

"I remember," he said, reluctantly, hating himself. Why couldn't he be big and tough and push this bully in the face and laugh as the brute fell over?

"Well, don't forget tomorrow. Tomorrow's the big day. The Space Fleet only take a few boys from each college. Maybe only one. And that one's going to be me. Understand?"

"I understand."

"You're too smart for your own good, Orfie. I know what the Head wanted you for today."

"He only——"

"Yes, I know. He had a message from your mummy and your daddy—that's it, isn't it?" Hateful, jeering laughter. Quiet and subdued in the long room. In case a master was walking in the dimly lit corridor outside. But altogether horrible.

Orfie fought back the tears. He wanted to stretch out and take the stars in his hand and throw them in the face of this big, burly, torturing boy. Watch them burn in a shower of sparks along the red, flushed face. Watch them turn the mocking sneers into screams of pain and fright. The stars. The stars were clean and cold. They were impersonal; they didn't care who took the sleek, shining ships from Earth out to them through the vast wastes of nothingness.

"So don't forget, Orfie." The low, menacing voice. "You just flunk the exams tomorrow. Otherwise . . ."

A hand found his throat and pressed and he gasped in the red pain-flecked darkness that closed over his staring eyes. The stars—dwindling and dis-

appearing in the grip of a strong hand round his throat.

Marshal stood up. He chuckled. His dark form seemed to reach up and touch the ceiling. Then he had gone, back to his own bed, and the still dormitory was quiet and sleeping and ghostly.

Orfic didn't sleep for a long time.

The desk was hard and warm and sweating under his palms. The heads of the boys were bent above their papers. There came rustles and subdued coughs, the scratching of pens.

He watched a small, black ant running in frantic little gambits from inkwell to desk edge. Back and forth. Almost over, then a scurrying lickety run back to the inkwell.

He felt a slow growth of kinship with the ant.

He was bound to it by ties of common frustration and misery. He was marooned alone on the top of a huge desk that speared out into the stars. There they shone. Bright and big and shining, like new toys on a Christmas tree. Not for him. They shone down and

around him and he shut his eyes and shook with sobs. He would be bound to the desk—the Earth—and the stars could shine for ever and know nothing of him.

He made marks on the paper. He read the questions. Simple. Too simple. He was filled with a misery that choked his eyes with the bile of unshed tears.

"Question six. You are in an orbit from Mars to Venus at 6 g. Your rockets fail. Bearing in mind the attraction of the sun and the relative positions of the planets, how would you . . ."

Simple. Child's play. Out there in the great wastes between the solitary stars, where the hyperspatial drive flung great masses of equipment at inconceivable velocities, was the proving ground for questions such as this. He put his answers down and choked over the agony they caused him.

The Head's patient, wise face floated before him.

"Do your best, Brown. For me. For yourself. And for the stars."

For the stars . . .

Orfie put his answers down and finished the paper and sat back and took a great, sobbing lungful of air. He did not look at Marshal.

The ant had crawled down the leg of the desk. It had gone. Perhaps it had taken his hopes with it. He didn't know. He remembered the laughing, casual talk of the boys, sitting with damp towels across their naked shoulders after the game. The smell of the chemicals in the water.

"Spaceship pilots? No future in that. I'm gonna be an atomic technician."

"Yeh. Me, I'm off to Mars; gonna find out just what did happen to them old Marties."

"Sure," Marshal had said, cock of the roost, arrogant, scornful. "They'll be spaceship pilots long after you're all dead and forgotten."

"Aw, gwan! My old man says they're building robots to pilot rockets now. He says men aren't quick enough in their reaction times. Something like that."

"You're a blue faced baboon. And your old man don't know what he's talking about."

The inevitable scuffle. The boys falling, screeching with laughter into the pool. And he'd sat there. Praying. Please, God! Don't let there be robots yet! Not until I've taken a ship off Earth. Until I've felt the sure, firm thrust of power, pushing upwards, taking me out to the stars. Please God! Don't let there be robots.

And now here he sat, still and dead inside.

And on the paper the dream of his life stark and chill in the blue-black scrawled lines of wavering handwriting.

They were dismissed. They went outside the examinations room and the air was full of shrill questions and laughter and cockiness, and complete and utter misery.

"Say, number three was dead easy!"

"Gwan! That one was a ringer! A trick question."

"Say, whaddya mean?"

"Well, didn't you spot it?"

And so on and so on.

Orfie crawled away and hid himself in his leafy hollow in the ditch at the end of the playing fields. He found all his treasures as he had left them. He didn't feel like playing

with them now. He'd grown up. He'd left behind him the need of symbols to share his misery.

He kicked the rich earth, watched the grass slowly bend back, and the straight dark line of the bruise on each stem flung a challenge at him. His eyes were full of the glory of the sunset, and the sweet, heady smell of new-cut grass floated levelly across the green into his nostrils.

Came results day.

The Great Hall was lined with the expectant boys, on tiptoe, buzzing, eager, shining-faced, waiting. The body of the hall was filled with the chairs of the parents. They sat there, self-conscious, proud, pulling their clothes around them, straightening their ties, glancing quickly at the flower-banked masses of boys' faces and away again.

In the front of the rows of chairs sat a group of white-haired, dessicated, intently watching men.

Marshal knew it all.

"There's Carmody—he's the greatest neural surgeon in the system. And Linton—

radiologist. And that's"—pointing with the brashly outflung finger of youth—"O'Keefe—micro-biologist. What are they doing here?"

"Come to see you take your prize, Marshal."

"Want a volunteer to dissect."

"Go on, Marshal, you volunteer."

The boys were bold now, bold with the knowledge that their parents were in the hall, and that this was the last day of term. The last day of school. Tomorrow—the world.

Orfie sat hunched up, withdrawn, apart, not of their world of warmth and friendliness and family life.

Tomorrow was the world. And he had wanted the stars.

The Head cleared his throat with the sound of a gravel truck changing gear. He adjusted his pince-nez.

Orfie did not hear the introductory speeches, or hear the bursts of applause. He was watching blindly an ant crawl across the smeared trail of the Milky Way.

The Head began to call out the names of those who had

passed the Finals. The first name was called.

Orfie's head went up, then, and a great drum-roll reverberated inside his head. He could not see clearly through the mist that was in his eyes.

"Marshal. First."

Orfie's head sank. His hands clenched themselves of their own volition. He could not bear to see Marshal stalk to the dais, take his scroll, shake hands with the Head.

The other boys' names were called. One after the other. Until all had been called out, had gone to the Head, taken their scroll, shaken hands, grinned self-consciously at some particular part of the hall where the clapping was loudest, and returned to the eager buzzings of their friends.

All had been called out.

Save one.

Brown.

The Head looked over his pince-nez at the group of scientists sitting on the edges of their chairs. He appeared to hesitate. Then he said, firmly:

"There is one other pupil who has not been included in the prize awards. The

reason, I am not at liberty to divulge."

The sun, sinking, deluged the tall windows with colour and sent a radiant pattern of stained glass over the packed people within the Great Hall.

"However." The Head picked up a scroll carefully, as though it were a Marshal's baton, or the wand of a celestial angel. "However, the pupil in question has, I may say inevitably so, scored marks far and away higher than any other boy. His name will not, however, be placed on the list of prize awards. There has been a——" the Head paused and looked helplessly at the assembled scientists beneath him. He swallowed and went on: "The boy is a special case. His brilliance is so outstanding that he cannot be compared with the others."

Through the wondering, speculative buzz in the hall Orfie heard the Head's voice as though it were coming from some deep-green cavern at the bed of the ocean.

"Brown. Come forward, please, and take your scroll of honour."

He was walking down between the chairs, the faces turned towards him like great blind flower-faces in a forgotten garden. The scroll crisp and smooth in his fingers. The Head's handclasp, warm and strong and comforting.

"Well done, Brown."

Walking back to the craning boys, the scroll clutched to his thin chest, wondering, surmising—what?

A special case?

Great Hall was as silent as a coffin.

No one clapped, because no one understood.

And then, a thin, haunting thread of applause.

A dozen handclaps, rising from the scientists, their ascetic faces flushed, the glitter of triumph in their eyes. The applause growing, swelling in a shame-faced, apologetic way throughout the Hall, until the hammer-beams resounded with the echoes.

Orfie stood, choked and silent, the scroll held like a new born baby.

Noise. Talking. People leaving. Boys shouting and pack-

ing and running down stairs and running back for forgotten items. Cars crunching away into the dusk. Lights springing up. The flavour of home-going, and departure, and the empty, dusty smell already of a school closed for the vacation.

Orfie stood again in the Head's study.

This time the scientists were there as well. Whispering together, looking at him. He felt he was a specimen under a microscope. Swimming helplessly on a slide.

"Ah, Brown," the Head said. "You have always wanted to go out into Space?" The same pattern on the carpet. It looked different now. Reds and blues and blacks.

"Yes, sir."

The Head looked across at the scientists. "It was a mistake not to tell me," he said, and there was a ring of wonder in his voice. "I could have helped him——"

"No," the micro-biologist said, softly. "No. That would have been a mistake. We wanted to know if he could survive amongst other boys. If he could be as human as

they. If he could learn, and adapt, and still retain the purpose."

"The examinations answer that. And his record."

"Yes. They answer that."

"You could have provided foster-parents——"

"Perhaps. It is not important. *Orfie*, you said? Just another buttress to his character. He has done well, we think. We are satisfied."

Orfie spoke then, for the first time, unasked.

"What——?" He could not say it. What he wanted to know was too hazy to put into words. His lips trembled.

"Brown," the Head said, quietly. "These gentlemen wanted to know if you had character. I knew about Marshal. He can never be a space pilot—far too big. He knew, too. He tested you, Brown. He tested for these gentlemen that you had that strength of character that they were not sure you possessed. I didn't know about you, when the orders came through. If I had, I might have wondered too." The Head took off his pince-nez and smiled tiredly, happily.

"But I never doubted you, Brown, ever."

Orfie stood silent and still, and wondering.

"You see, Brown, these gentlemen wanted to know if your desire to go into Space would last unchanged. They instilled that drive, that desire in you at the beginning. You are perfectly suited for spatial work. Your body is right. You are far quicker in reaction time than a human. You are ideally suited for a rocket pilot."

The scientists nodded grave agreement.

"But, you see, Brown. After they had made you, and made the first practicable android, they wanted to know if you had the human gift of courage."

Orfie knew, now.

And he smiled.

The answer to that, to his courage, lay in the examination paper. He lifted his head and forgot about the pattern on the carpet.

To shake the stars! And they were all his!

He was the first real spaceman!

Already, on Earth, we have the practical basis for feeding colonies on barren planets.

PLANET FARMS

by GEORGE C. DUNCAN

SCIENCE FICTION has often been ahead of the most sensational scientific laboratory work, and a good example of how SF anticipates events is in the question of food on other planets. How often have you seen yeast farms mentioned in stories? Or you may have come across it mentioned as the food metabolizer. Have a look through some of your copies of *Authentic* and you are certain to find some mention of the subject somewhere. Yes, SF takes it for granted, and the laboratories are working out the details for tomorrow.

Bacterial Steaks

Recently two items of news from the labs has pointed this way. The most recent was a quiet announcement from a large company that one of its scientists had found a bacterium which could be grown in large quantities in flasks. He was so impressed that he left the problem he was working on to give some attention to the bacteria which so clogged the liquid in his

flask that it made a thick soup when he gave it the right amount of heat, light and chemicals upon which to grow.

The organism was a bacterium. It was known as one of the *B. coli*. He found it in a dead calf on a mountain hillside in Wales. There is a disease of young calves known as White Scour, and it was this that he was investigating. He took his sample back to the laboratory and, in order to study it closer, he grew it in flasks. That was the beginning of its becoming an important item in the research schedule. It grew well on a water solution containing ammonium salts, which could be obtained cheaply and in large quantities.

The bacterial cells were centrifuged after they had been killed by moist heat, washed well to remove all traces of the liquid in which they had been growing, and the product, probably by this time in cakes or slabs, ground to a fine powder. Chemical analysis showed that the powder contained an exceptionally

large amount of protein. This was interesting because, normally, man gets protein, an essential part of his diet, from the plants and animals of the farm.

Of course there were a few other important items present in the powder. There were vitamins, fats and sugars. In other words the dead bacteria was a nutritious foodstuff. The question then arose as to whether it was also a poisonous foodstuff. Bacteria which cause diseases are not always in themselves dangerous, but are called pathological because of the poisons or toxins they produce by their ordinary living processes. It was this poison which had to be cleared out of the dead bacteria. It was important to cut out any possibility of animals or humans who were fed on bacterial protein suffering from the poison.

This was done and laboratory animals were fed with the product. Not only did it take the place of ordinary food, but it was better. Quite large scale feeding experiments were done and it was found that young rats and young pigs thrived on the new food.

Large-scale production is now being planned, and it is possible that in the next few

years we may see a microscopic organism being fed to farm animals by the ton. How long, you say, before bacterial steaks are available? Well, that is something else we might have to wait for! During the last war a food yeast was grown on molasses in the West Indies, and many of us would have been happy to have had a yeast steak at the time. News about this development has faded since the efforts of traditional farming methods have increased the amount of meat in the world.

Primitive Plants

Many of us will have seen the green algæ which grows on water butts in the back garden and in ponds and streams. The culture of algæ has been going on in a dozen or so labs in the United States and Britain for the last few years. All sorts of authorities have tried to define the group of plants known as algæ and the best that can be done is to emphasise that they are plants of very simple structure, including some of the most primitive forms. They are very varied in size, shape and colour. Seaweeds, for example, are in the same class of plants as the tiny green cells growing in the

water butt or on the sides of a fence in the back garden.

One way of estimating how vigorous a plant may be is to find out how much carbon it will "fix" in a year. It has been estimated that land plants fix 1.6 to 15.5×10^{10} tons of carbon every year. That is a lot of carbon and, strangely enough, the plants that grow in water are believed to fix at least as much as this. Thus, given a planet with a great deal of water, carbon dioxide, sunlight and algæ available and you will have the biggest farming unit in the business.

The actual chemistry which goes on inside the cells of the plant is often of such a complex nature that one realises why time and patience are so necessary when trying to understand plant chemistry. The plant does not have the clutter of flasks, bunsen burners and thermometers with which to control all the reactions that are going on. To take the place of these it has an enzyme system. An enzyme is a substance which helps two chemicals to react or causes one to break down into simpler chemicals.

Enzyme Clues

Algæ have been shown to contain a number of enzymes

which act on various chemicals. If one knows what enzymes are present in a plant cell then one can make a good guess at the chemical changes which go on in the cell.

It has been from such clues that knowledge has been built up about the chemical working of the algæ. An example of the work that these enzymes can bring about is in the tri-carboxylic acid cycle—a complex respiratory process in plants. Here, another factor is required besides enzymes. That factor is Vitamin B₁, sometimes called aneurin or thiamin, though the latter name is more common in the U.S.A. The need for this factor has been proved practically by finding out the amount of pyruvic acid an alga will oxidise or burn up for energy (respire) when there is a shortage of vitamin B₁, and then comparing it with the same burning-up process when the plant has plenty of the vitamin.

If you want to be an algæ farmer this is the sort of information you must have about your crops. Some algæ can make their own aneurin, in which case it is unnecessary to add any to the liquid in which they are grown. Mean-

while analysis of the contents of a large number of these plants has shown them to contain vitamin B₁.

The 'soil' upon which these plants grow is the next item of interest. The ordinary plant culture solutions are not suitable, but much more dilute solutions are required. If you wish to experiment with growing algæ, the following formulæ will allow you to try your hand.

Formula 1.

Ammonium hydrogen phosphate	0.08 parts
Potassium hydrogen phosphate	0.04 parts
Magnesium sulphate, heptahydrate	0.04 parts
Calcium sulphate	0.04 parts
Distilled water..... to	100 parts
For use add 1 part to 99 parts distilled water.	

Formula 2.

Ammonium nitrate ...	0.1 parts
Potassium phosphate .	0.02 parts
Magnesium sulphate..	0.01 parts
Iron chloride (ferric)...	0.001 parts
Distilled water..... to	100 parts

Both of these solutions are simple to make, and require little expenditure to obtain sufficient for many experiments. When you do this work, use distilled water and clean containers. Glass is ideal, and for small-scale work the

humble jam jar is quite suitable. To get your algæ you can try the back garden water butt and any long-standing pools of rain water. If you live in the country you can get plentiful supplies from streams and ponds. You will find them growing as a thick green scum on the sides of water butts. The amount need be only sufficient to give a green tinge to the water, though if you can get enough to make a layer in your container all to the good. The plants you require are not much larger and probably smaller than any full stop on this page. You may be lucky and find some red algæ, in which case keep them separate from the green specimens.

Algæ are sometimes exacting in the conditions they require to get ample growth, but if you hit their ideal it is possible to get them to increase a hundredfold within a few days. They are sensitive to temperature, and a few degrees either way on the thermometer will make a great deal of difference to your crop. Next there is the possibility that the type you find will require special food. If you don't get good growth, use a soil extract, made by boiling soil for half an hour

with an equal volume of water and decanting the cooled supernatant liquid into your culture.

Large-scale Cultures

Of course you will be interested in knowing how this will be done on a large scale. Exact details of the method are not yet available, but some intelligent guesses can be made from the information which recent research has brought to light. It is known that to get maximum results about four or five inches only of solution should be used so that sunlight can easily penetrate the culture. The first large scale terrestrial algæ farms will probably be situated in sheltered valleys where thousands of shallow pans can be laid out. A good stream of water would be useful, and there would have to be a laboratory at the top of the valley controlling the constituents in the water running down into the pans. This would have analytical equipment and a small scientific staff to add or subtract material from the water as required.

Then there would be the culture lab, which would have pure strains of the algæ suitable for the area. The algæ

would be added to the pans so that there was a certain number in every cubic centimetre of the liquid. The salt-containing water running down the hill and through the pans would ensure that the culture would grow. It might be necessary to put some form of heat under the pans, and if the farm was in a volcanic area it might be possible to supply this heat from volcanic springs,

Harvesting would go on all the year round, and the method would be quite simple. A large tank lorry with a filter vacuum hose would suck the algæ soup out of the pans—returning the filtrate—and transport it down to the processing unit. The soup would be centrifuged and dried quickly so that there would be no loss due to fermentation or bacterial contamination. The last stage or stages might be the extraction of the chemicals so that they could be used as food for humans or animals. Or the algal mass may be used as it is for farm fodder. The algæ are rich sources of many chemicals, and are already being utilised for various compounds. The seaweed industry has reached sizeable proportions in Britain already, and it is probable

that the present methods of collecting seaweed would be abandoned in favour of some such scheme as that described above. Up to the time of the last war, agar-agar, a substance used in the pharmaceutical industry, was obtained from Japan. Then Australia and Britain started alternative methods of production, so that the Japanese methods have been replaced. Agar-agar is used in making the growth media for the culturing of bacteria. *Chondrus crispus*, which is also known as carrageen moss—though not a moss, but an alga—is the present source of agar-agar.

This sort of product would be comparatively simple to obtain when one considers some of the other substances one could "farm" on a large scale. *Chlorella pyrenoidosa*, a unicellular green alga, is a source of ergosterol, which is the starting point for the production of vitamin D₂, the synthetic vitamin D. Then there are proteins available with a wide range of amino acids. You will already know that the amino acids when joined together form proteins. In the algæ it has definitely been shown that there is a great number of these acids.

We have not dealt with the classification of the plants, but it is sufficient to note that there is a number of different coloured organisms. Blue-green, red, green and a number near or around the yellow to brown colour range. These colours are derived from a variety of natural pigments which may well set the printing and dyestuff industry rocking with pleasure.

Lastly there is a range of carbohydrates, usually polysaccharides, which, if they were broken down chemically, might yield useful chemicals for industry.

Present-day Farms

Now you may say, after all this, where does our optimism come from about algæ farms? This is the next item which must be mentioned. Research has shown that one of the *Chlorella* species could supply a host of proteins, fats, carbohydrates and vitamins. There have been various ways in which *Chlorella* has been grown. There is an algæ farm in the United States which pumps *Chlorella* in a suitable growing medium through plastic pipes threaded over an open space and well exposed to sunshine. The thick crops of algæ which it has produced

have been used as a large scale source of experimental material at the research labs. Then, continuous processes have been tried in pilot scale equipment. These have consisted of a number of flat pans, fed from a reservoir of the growing medium. As the algæ grow they are run out of the pans into a continuous centrifuge, where the plants stay while the liquid runs off and is pumped back to the reservoir.

Another method has been tried on a small scale, and that has used a kind of cell. It is made from plastic, is only a few inches thick, but has a considerable width and length. The algæ grow in the medium while carbon dioxide is bubbled through and light and temperature are carefully controlled. Another thing which has helped these plants to yield greater crops is to have the light flashing on and off so that they do not get a steady glare.

One can imagine plastic

cells of the type indicated above, pivoted and revolving in the wind so that alternate sides of the unit would be turned towards the sun. An algæ farm, with a forest of these flattish revolving cells gently whirling round, would be a sight worth seeing.

The facts are known about these plants, and it only remains to get the ideal method of production. No doubt in a few years there will be several of these food factories turning out their harvest all the year round, and then when we get out to the planets it should not be difficult to find one, say Mars, with the ideal conditions, the carbon dioxide content in the atmosphere, and the amount of sunlight to make it worth our while to start the first planet farm. A regular stream of supply ships shuttling round the solar system would feed a well spread out human population, and one much larger than that on Earth at the moment.

Watch out for details of our
New Competition
In next month's **AUTHENTIC**

When life is a game of chess,
Robots may be pawns or
queens—or both!

ROBOTS' GAMBIT

by RICHARD WILSON

THE TALL young man and the robot walked side by side down the path from the factory. The young man worked there; the robot had been manufactured there.

The young man saw his fiancée waiting for him at the curb in her convertible. "Hi, Carol," he called.

"Hello, Mike." Carol Mercer was twenty-four, her hair the colour of autumn leaves and her voice crisp and bright. "Who's your friend?"

"He's for Dad," said Mike Hobbs. "Birthday present for the old gentleman. Got room for three in the front?"

The robot stopped, with Mike, at the curb. He stood there expressionless, his eyes looking at Carol, his slim

frame dressed neatly in a blue serge suit. The face was that of a man of sixty, and it had a thick white moustache which matched the shock of hair on his hatless head.

"You bought that?" asked Carol, incredulous. "You bought a *robot* for your father?" Her eyes flashed angrily. "Are you out of your mind?"

"But I got him wholesale," said the young man. "I had to get him for Dad after your father bought Mr. Morphy. If there's one thing Dad likes to do it's to keep up with the Mercers."

"The whole thing is ridiculous," snapped Carol. She tossed an auburn mass over her shoulder. "Just because

my father gets a mechanical monster to play chess with, your father doesn't have to have one. He could have borrowed ours."

"Oh, he could, could he? Well," said Mike, "it just so happens that your father won't let anybody else play with Mr. Morphy. In fact, Mr. Mercer won't even play chess with my dad any more. Says he's too busy proving something with the robot—something about a robot assimilating all the best strategy of his opponent until he can't be beaten by the human being who trained him."

"I think the entire matter is too childish to discuss," said Carol Mercer. "Two mature, retired men in their prime of life caring about nothing but chess, chess, chess. And now you aid and abet the mania by buying another stupid robot for—for just exactly what it would have cost us to put up our pre-fabricated house. Really, Mike, you don't have any consideration for me—for us. If that's all you think of our engagement you can consider it off!"

Carol burst into tears, but

checked them instantly. She took off her glove and then her engagement ring. She handed the gleaming circlet to the robot. "Here, robot," she said. "Obviously he thinks more of you than he does of me."

The robot, reacting as he had been trained, automatically extended a hand and let the ring fall into his pink, fleshoid palm.

"Carol, wait," said Mike. But she put the car into gear and sped off, leaving him and the robot standing on the sidewalk.

Mike took the ring from the mechanical man and stared at it for a moment before stuffing it into a pocket.

"Women," he said. "They're one hundred per cent. pure, unadulterated emotion, without an iota of logic."

The robot, who was one hundred per cent. logic without an iota of emotion, adapted his response to the situation. "You're right, sir."

Mike hailed a cab. The driver watched his two fares get in. He leaned back and whispered to Mike: "That

gentleman with you, mister, isn't he a robot?"

"Yes."

"That'll be a dollar extra, then. Licence bureau ruling. Says we got to consider robots the same as trunks."

Henry Hobbs was deep in a chess problem when his son and the robot walked into the study. Mr. Hobbs was lean, bald, hawk-faced and, at the moment, irritable. He was muttering to himself.

"Mercer solved this one in twenty minutes, did he? When I've been at it for an hour? The prevaricating old rascal! More likely his mechanical man solved it, if anyone did." Mr. Hobbs moved a knight tentatively, then banged it back to where it had been. "Twenty minutes, indeed!"

He hadn't seen them come in.

"All right," whispered the son. "Now!"

Two voices, one human and one mechanically tinny, began to sing "Happy birthday to you, happy birthday to you, happy birthday, dear father, happy birthday to you!"

The older man sat back in his wheelchair and blinked his eyes rapidly. Then he took out a handkerchief and honked loudly.

"My dear Michael. Thank you. And thank you, too, sir." He put on his eyeglasses and held out a hand. "Forgive me if I don't get up. Damned doctor says I have to stay put. Don't believe I've had the pleasure, sir."

The robot, reacting as taught, bowed, ignoring the outstretched hand. "Your servant, sir," he said.

"I beg your pardon?" Mike's father said. "What's all this ceremony nonsense? My name's Hobbs. What's yours? Sit down, sit down; pull up a chair for the gentleman, Michael."

"His name will be up to you, Dad. He's a robot. And he's yours to wheel you around, or fetch down books, or cook, or send to the store or——" he paused slyly—"maybe you could teach him chess."

The elder Hobbs was overcome, but his excitement kept the emotion momentary.

"Son," he said, "you

couldn't have done a nicer thing. Of course I'll teach him chess. Now, Mr. Robot, we'll have none of this master-servant foolishness. You're as dignified a looking gentleman as ever I've seen, and it will be a pleasure to have you with us. Welcome to our home. Now, as for names. Mine is Henry, and yours—yours will be—let me see—yours will be Jose. We'll shake hands on that, Jose."

The real old gentleman and the synthetic one clasped hands. Mr. Hobbs was aglow and Jose's face broke into a warm, almost unmechanical smile.

"Jose Capablanca, you know," explained Mr. Hobbs to the robot. "The Cuban chess genius. A much greater man than that mechanical Paul Morphy, that flash in the pan that Old Mercer named his robot after."

"Mr. Mercer has this theory you heard Carol mention, Jose," Mike said to the robot. He stopped for a moment at the thought of the girl, then pushed his personal problem to the back of his mind. After all, it was his father's birth-

day. "About a mechanical chess player being able to outplay the man who taught him after the robot had absorbed the rudiments of the game. Well, Dad and Mr. Mercer have been playing each other for years, and there's never been a clear-cut decision. One of them will win occasionally, and then the other, but they're about evenly matched."

"I don't like to be immodest, son," put in Mr. Hobbs, "but I do think you overstate the case for Old Mercer. He has a certain amount of flair but, really, he's not in my class."

"That remains to be proved," said Mike. "The way to prove it conclusively would be for you to teach Jose everything you know about chess and then match him against Morphy, who's been taught everything Mr. Mercer knows. Wouldn't that do it? The robot who won that match would show beyond a doubt that his teacher was the better player."

As Mike paused, Jose the robot felt his wheels of logic spinning inside him and made

the perfect move. He sat down opposite Mr. Hobbs.

"Would you teach me the game, Henry?" he asked. "I'm very anxious to learn."

Mr. Hobbs slapped his knee and chuckled. "Delighted, Jose, delighted." As he set up the pieces he said to Mike: "Wait till Jose tangles with that Morphy. It'll be murder, son—sheer black-and-white murder."

Carol slammed the door behind her. Her father was in the library, of course, bent over a chess board. His heavy forehead was creased with more than the usual number of lines and his mouth was set in a pout that was out of place in a man of his years.

Sitting across from Mr. Mercer was the mechanical man he had named for Paul Morphy, the nineteenth century chess wizard. The robot was calm and relaxed. He had just moved.

"An Alekhine combination, by Jupiter!" said Mr. Mercer. "I recognise it now. He used it against Tylor at Margate in—let me see—1937. Where the

devil did you pick that up, Morphy?"

"From you, sir," the robot replied. He had been made in the form of a heavy-set man, grey-haired and comfortable-looking. "You've taught me everything I know about chess."

"Yes, yes, of course," said the man. "But it certainly is a shock to see something like that coming back at you . . . Carol, my dear, hello. Why, what's the matter?"

"Oh, father, that Mike is a beast. I hate him!"

"What's he done, the cad?"

"He took all the money we were going to use to build our house and spent it—simply threw it away!"

"But your house is all bought, Carol. The pieces are all stacked in the old barn out back. Finest pre-fab outfit I ever saw. All you have to do is hire the assemblers to put it up when you're married."

"We're not being married." Carol dropped to her knees and put her head in her father's ample lap. "I gave him back his ring," she sobbed. "I hate him, the selfish brute!"

"Now, now." Mr. Mercer patted her auburn head with a clumsy hand. "It can't be as bad as all that. What exactly did he do that was so terrible?"

"He took all that money and——" she glared at Mr. Morphy "——and bought a robot. For *his* father to play chess with. The fool!"

Mr. Mercer considered this. "Why, that addle-pated old copy-cat! Never had an original idea in his life. Shows up in his chess game, too. Strictly an academician, Hobbs is. A plodding, long-winded player without invention. So now he's got a robot, has he? Hmm."

"Oh, you're all alike," cried Carol. She flung herself to her feet. "You and Mr. Hobbs and Mike—and of course the robots, who never were taught to do anything else. Chess, chess, chess. That's all you ever think about. Nothing else matters to your narrow souls!"

"Now, Carol, you once were fond of the royal game. I remember what fun we had together, when your mother was still alive, teaching you the moves."

"That was when I was twelve, father—half as old as I am now. By the time I was thirteen I was sick and tired of the stupid game. Gambits, combinations, castling, *en passant*, Philidor, Reshevsky! It's a foolish game for foolish people who could be doing important things with their energy. Check! Checkmate! Phooey!"

And she kicked Morphy on his simulated ankle. The robot made no sign.

"Carol!" said her father, sharply. "Go to your room. You may come down when you've stopped being a child. The idea of a grown young woman acting this way over a silly lovers' quarrel!"

"Now, Mr. Morphy, we'll see about this little combination of yours—or mine, or Alekhine's, or whosoever it is. I'll just take your queen, you see, with my rook. Weren't expecting that, were you?"

"On the contrary, Mr. Mercer," said the robot. "I had planned it. My move is rook takes knight—check! Then I think you will see that the end is inevitable."

Mr. Mercer confidently lifted a hand to remove the offending white rook with his king, but then stopped. He frowned. He glowered. He saw his doom. He gave a little strangled cry of frustration.

And he kicked the robot on the ankle.

"I will not go," said Carol to her father. "The whole thing is stupid, ridiculous, fantastic. Two robots playing chess against each other to decide whose master has more right to his vanity. What nonsense!"

"I have explained to you, Carol," said Mr. Mercer, "that we require two judges for this tournament. Michael will be one and you will be the other. Old Hobbs and myself are disqualified because, in effect, we will be playing, with each robot using the best of what it has learned from each of us. It will settle once and for all the question of who is the better player—me or Hobbs. Not that I have any question in my mind, but I've got to convince old Hobbs."

"I will not see that Mike Hobbs. I haven't seen him for two months and I will not see him now."

"But for two months you have been miserable, young lady. Mike has called; he's sent flowers, he's written and wired and acted in every way like a gentleman. You love him; you know it and I know it. But if *he* isn't convinced of it very soon, you'll lose him, and then you'll have real cause to be miserable. Morphy, Miss Mercer's coat, please."

The robot had it ready.

"I won't go," said Carol, putting her arms into the sleeves. "It's ridiculous. Do I look all right, father? What nonsense—a robot chess tournament! Is my mouth on straight? I'm only going to please you, father, you know."

"I know, my dear. Is the car here or shall we take a cab?"

Mike Hobbs opened the door.

"Carol!" he said. He moved to take her in his arms, but she pushed him away with dignity.

"I'm here in an official

capacity only, Michael. I'm to be a judge at this adolescent tournament, to see that your father's robot doesn't hide any knights up his sleeve."

The study of the Hobbs home was crowded. Officials and selected members of the local chess club, the editors of a chess magazine, photographers and a wire service reporter were waiting for the mechanical battle to begin. It promised to be a short contest, as chess went, because the robots would be playing with clockwork precision, moving their pieces almost instantaneously on the basis of their stored-up knowledge of the complicated game. A television camera was trained on the board and the empty chairs at the table, and a motion picture camera was ready to record the game and project it later in slow motion so it could be studied by slower human minds.

"Carol," said Mike, "please take back the ring." He was talking to her in a quiet corner of the room. "It's been lonely without you. Let's forget that silly quarrel.

I love you, Carol. Don't you love me?"

"The man I loved was a considerate, intelligent man who was going to marry me and move into a house of our own. He wasn't the man who let the bits and pieces of the house gather dust in a barn while he spent all the money on a robot. I don't see how we can live in a barn, with a house all in pieces."

"We'll have that money again. I've already saved a lot toward it and in another few months we'll have enough."

"Another few months! Maybe in that time you'll be able to find another girl. It won't be me—you robot fancier!" She tilted up her nose and walked into the hubbub at the centre of the room.

The wire service reporter was talking to Mike's father.

"As I understand it, Mr. Hobbs, neither robot has played against anyone but his master—the so-called Morphy against Mr. Mercer and Capablanca against you?"

"That's correct. In addition, the robots have not been allowed to read any books on

chess. They read amazingly well, you know, never forgetting a thing. My Jose has become an excellent chef on the basis of his reading of cookery books."

"I see," said the reporter. "And so, if the robot Morphy wins the tournament, Mr. Mercer will be adjudged the champion, and if the robot Capablanca wins, you will be the better man?"

"Exactly."

The mechanical contestants sat down at the board, Morphy's heavy-set frame filling the chair and Capablanca's wiry manufactured body alert on the edge of its seat.

Carol, Mike and their fathers took their places close to the contest table. The cameras began to grind as Jose Capablanca, the host robot, shook a black and a white pawn in his cupped hands to determine who would have first play. Morphy won the white and opened with his queen's pawn. Capablanca went into the Dutch defence. Quiet settled over the room as the play proceeded with superhuman rapidity.

The robot Morphy won the

rapid-fire game with check-mate in fewer than two dozen moves, and the audience applauded.

"That's my boy!" cried old Mr. Mercer.

The second game got under way, Mr. Hobbs' robot playing white this time. The play was too fast for human minds to follow completely, and at the end of ten minutes Morphy tipped over the black king. "I resign," the robot announced.

Mr. Hobbs beamed.

"I protest!" shouted Mr. Mercer. "He should have played to the finish."

His daughter and Mike, as judges, overruled him.

"Apparently it was impossible for your robot to win, father," Carol said. "It went too fast for me, but the films undoubtedly will show why he resigned. Be a good loser, Pop."

Mr. Mercer grumbled, but was secretly pleased by the interest with which his daughter—who professed to hate the game—was following each whizzing move.

The tournament went on. Game after game was played.

Mr. Mercer's robot won the third and fourth. The fifth was a draw. But then Mr. Hobbs' robot cut into Morphy's lead and pulled ahead. Capablanca took a two-game advantage, held it through another draw, then won the decisive game.

The entire tournament had been played by the robots in less than three hours.

"We won, Dad!" said Mike. "I knew we could do it."

Mr. Hobbs waved away the congratulations. "It was very novel and interesting. The robots must play a return match sometime soon, Mercer. But I'd much rather play a living game with you, old man. One we can relax over, with cigars and a drop of port. This lightning chess makes me dizzy. What do you say, my friend?"

Mr. Mercer struggled to be gracious and succeeded. He smiled and held out a hand to Mr. Hobbs. "Of course," he said. "But your Capablanca is a better man than my Morphy. No doubt of it." The old man swallowed, then said with an obvious effort: "And you're a better player than I am. I always knew it, but

pride kept me from admitting it. Yes, I'd like a man-to-man game. How about tomorrow night?"

Carol shot a fond glance at her father. "The old boy's really a good sport, deep down," she said to Mike. She drew him away from the group of professional chess enthusiasts who were clustered around the robots, examining them and talking to their owners.

She squeezed Mike's hand. "I think I can be just as good a sport about something much more important than chess—important as that is to our Pops. Seeing your father tonight reminded me that he uses a wheelchair. I'd got so used to seeing it that I'd forgotten he was lame—truly forgotten. And of course he had to have a robot—for a lot more important reasons than my father got one."

"Darling," said Mike.

"I'm sorry I made such a fuss about the house," said the girl. "We'll have it put up whenever you say. I can wait a few months because I know we'll be spending the rest of our lives in that house. If"—

Carol added—"if you'll let me have the ring again."

Their kiss was interrupted by the flash of a photographer's camera.

"Perfect," said the Press photographer. "When Judge Meets Judge. Or Robot Chess Match Doesn't Lack Human Element. Which caption would you prefer?"

"Either one," said Mike, blinking. "So long as the picture goes on the page with the rest of the wedding announcements."

"Where are the robots?" asked Mr. Hobbs. "I haven't seen them since the crowd left."

"They were in the room with us for a while," said Carol. "They were sitting off in a corner sort of chuckling to themselves while Mike and I talked about our house. We decided we want it on the opposite corner of the property from your house, father."

"Fine, fine," said Mr. Mercer. "But where *are* the robots? And can they communicate with each other?"

"Of course they can," said

Mike. "As Carol said, we were talking and looking through the instructions for assembling the pre-fab. The robots were still there when we left to join you here in the living room."

"Well, I was just in the study and they're not there now," said Mr. Mercer.

Mike and Carol went through the house, room by room, but the robots were gone.

"You don't suppose they ran away?" asked Mr. Hobbs. He was nervously trundling himself back and forth in his wheelchair. "Perhaps off to the chess club? Or off to a carnival to play on exhibition? They seemed to like the touch of publicity they got tonight."

"They wouldn't do that," said Mike. "It's not in their makeup, and I mean that literally. They're made to serve their masters to the best of their ability, and they wouldn't do anything to inconvenience them."

"Well," said his father, "they're gone. And where the blazes do you look for a runaway robot?"

They searched the house again, and the grounds, then drove to the Mercer home. The robots weren't there, either.

Mike and Carol looked into the old barn behind the house.

"Mike! Our house! The sections! They've been stolen!"

But Mike was grinning with a glimmer of suspicion.

"Come on!" he said. He took Carol's hand and ran with her to the other end of the property.

There, under improvised searchlights, where nothing but a foundation had existed that afternoon, stood a house, completely fabricated. They heard hammering coming from inside it.

"Mike!" said Carol. "Do you suppose——?"

Her unfinished question was answered as the hammering stopped and the two robots appeared at the front door.

"Jose and Paul, you clock-work rascals!" said Mike. "What have you been up to?"

The robots smiled proudly.

"The plans were very complete, Michael," said Jose. "And your and Miss Carol's wishes were obvious."

"We couldn't help hearing your conversation," added Paul. "Our ears were made to be very sensitive."

"We hope our service has been satisfactory," said Jose.

"You darlings!" said Carol. "I could kiss both of you, you—you champions! *Aren't* they champions, Mike, both of them, through and through?"

"Right," said Mike, "my love."

"Now we can be married right away," she said. "Mike—this week end!"

"Check, mate!" said Mike.

ARISTOTLE

by H. J. C.

ARISTOTLE, who was rather fond of paradoxes, would probably be intrigued by posterity's assessment of him. Of no other man can it be said that he gave science so much that its progress was retarded for sixteen hundred years!

He had enormous depth and range of perception, probably greater than any man living or dead. Yet the very girth of his intellect formed a millstone round the necks of lesser men for centuries after his time. The man whose life was devoted to advancing science accomplished the very opposite, for science remained virtually stagnant from the day of his death to the middle of the seventeenth century.

Why was this? Aristotle wrote so prolifically, so omnisciently and so dogmatically, with such apparent truth and

validity, that for hundreds of years after his time scientific arguments were settled by looking up what he had said. Men of learning in those days did not observe nature. Their object in life was to reach the true interpretation of what Aristotle wrote. And since Aristotle wrote about everything, stagnation obtained in all fields of enquiry, for Aristotle's writings were really lecture and discussion notes, altered from time to time as their author's opinions changed. They are full of contradictions and inaccuracies, making the interpreter's task a long and arduous one.

Aristotle, while beginning life as a zoologist and continuing to give special attention to biological matters, was pre-eminently a philosopher. It is his philosophical teachings that have alone

stood the test of time, and which have had more effect on human thought than, it has been said, the founders of the great religions. Inextricably mixed with his expositions of philosophy is the doctrine of traditional logic—nowadays clearly demarcated from philosophy.

He invented logic, though not, of course, rational thought! He was the first to systematise the principles of valid thought and, quite naturally, fell down here and there under the magnitude of his task. Nevertheless, the groundwork of present-day logic is still Aristotelian, and his fundamental axioms have never been replaced by any other system.

Logicians, today, do not make the mistake of believing everything Aristotle wrote. By the most careful scrutiny of the world's best minds, certain parts of Aristotle's logical doctrines have had to be discarded or modified, but far more is retained than is

thrown out. It is probably safe to say that no one nowadays reads Aristotle for instruction—only for interest.

To Aristotle the arbitrary divisions of knowledge did not exist. Thus, his exposition of logical and philosophical doctrines overflows into the realm of actuality—anatomy, physiology, astronomy and so on. Here it is that he was so very wrong. While admiring the intensity of his search and the virtuosity of his deductions, we nevertheless have to admit that few men could reach so many right conclusions from wrong data!

His practical technique was hopelessly unscientific and he seemed genuinely incapable of seeing what was in front of his eyes. For instance, in spite of the fact that he carried out many hundreds of dissections, he maintained firmly that the brain was bloodless and did not reach to the back of the skull, which he said was empty. Even so, there is quite a lot of accurate observa-

tion in his writings. Thereby arose the confusion of early men of science. Here and there they came across some fact of observation in their own lives that was at variance with what Aristotle said. But since so much of what he said did seem to be borne out in practice, his word was taken and not the fact. This was the most vicious circular argument ever to threaten the existence of science.

But Aristotle's main failing was that he did observational work simply in order to have a small amount of data to start with. Then, instead of following up his observations with experiments, he sat back and started working out the fundamentals by logic, by pure reason—and never did he put his conclusions to the experimental test. He was, indeed, an armchair scientist! That way he arrived at all kinds of nonsensical explanations that were accepted partly

because they were valid arguments—from false premises, of course—and partly because they tended to confirm various religious doctrines.

For example, he believed that thunder was really the sound made by fire reacting with water in the clouds. He reasoned that because thunder itself is a reaction between fire and cloud water, and because the reaction of fire and cloud water cause thunder, then “the nature of the thing and the reason of the fact are identical.” Pernicious doctrine, to say the least!

Because of all these things it is not easy to say precisely what Aristotle did for science. It is a topic that has to be talked around rather than defined. There can be no doubt that he had a tremendous influence on the world. Neither can there be any doubt that he has caused a great many headaches and frustrations!

Next month we shall talk about

JOHN STUART MILL

Sometimes the hard way turns out to be easiest and best, especially on

THE DAY OF ALL ELSE

by ANTHONY G. WILLIAMSON

BILL KANE was an engineer—a Chief Engineer in fact. His post was a small seat behind a bank of dials and indicators, with the “hot” walls of the fission chamber on one side and the noisy bulk of the generators on the other.

Time had dulled the ceaseless scream of the machines, cooled the skin-cracking heat of the fission chamber, and turned the dials into a bank of monotonous faces that never changed. Never offered cause for alarm, though at times he prayed for such a welcome diversion.

The passage of time had also changed his face. Turned the smooth, white skin into a harsh, mahogany coloured visage that was warped and traced by countless wrinkles

that deepened almost to crevices about the mouth. Eyes, once blue and cheerful, were now faded and gave one the impression of looking into unfathomable depths. Over immense distances that swallowed you up and made you feel small and insignificant.

To him life had lost its vibrant call, the beckoning finger that sent his companions rushing through their meagre years in a futile effort to amass wealth—snatching greedily at the spices of happiness as they went. And yet he had found peace.

At the rear of the engine room there was a small observation window that looked out from the side of the ship. A simple square of steel-ribbed plastic that afforded a magnificent view of the universe. A picture that told a

story, but which few had the time to discover.

Often he would stroll to this window, pull out his chipped and dirty pipe to stuff its ample bowl with tobacco and puff it into a glowing fragrance. Here he would stand and let his eyes take in the immense distances, savour the beauty of the glittering stars and feel a certain kinship with their loneliness.

There used to be a time, many years ago, when he watched from the window only when a new planet rose out of the void. Then he would thrill to the magic of it, as they screamed through a new atmosphere and dropped towards barren plains or gleaming cities. But now he stayed in his seat when they went in to land. Space had shown him beauty and man had shown him ugliness—he preferred beauty. It was as simple as that.

At least these were his thoughts as he stood by the window with his pipe clamped comfortably between his teeth and his gnarled hands clasped loosely behind his back. Yet

there was a nagging doubt. Was he not getting old?

There was the girl for instance. Of course it was an hallucination; she couldn't exist, really. He smiled wryly and rebuked himself for even entertaining any doubt. How could a woman exist in space? Without a spacesuit!

Twice he had seen her, or was it three times? He pondered for a moment, remembering that they had been two days out from Altair when she had appeared for the first time. Yes, that was it, three times.

Glancing back at the instruments, he noted their readings, assured himself that everything was in order before turning again to the glittering vista. She was beautiful. His eyes took on a dreamy look as he built the picture in his mind. In fact she was everything he had ever looked for in a woman.

Suddenly he was alert, reflections gone as the faint sound of music came to him. There it was again. Every time he had seen her there had always been the same music.

He listened, unconsciously straining his eyes across the void. It was strangely moving music, like a saxophone with a lonely voice.

The breath hissed through his teeth as she appeared, only yards from the ship. Why couldn't someone else see her instead of him? But he was glad she had come. The warmth of her presence seemed to enter the ship and fill him with a strange happiness.

She wore a single garment of deep green which clung to the smooth curves of her body, and as the light from the window caught her in its glow a wealth of jet black hair glistened about a pale white face.

He gazed hungrily towards her, yearning for something which he knew was insane. As he looked, however, she seemed to come closer, and for the first time he was able to study her face. A moment later he was sorry, for there was pain in that face. Pain and loneliness that seemed to be pleading with him.

He jerked away from the window as he realised what he

was doing. Obviously she could only exist in his mind. Fear washed through him as he thought of the men who had gone mad in space. Some of them had suddenly begun to see things that didn't exist.

Ignoring the window, he returned to his instruments, noting by the chronometer that his relief would shortly be arriving. Resolutely keeping his thoughts away from what he had seen he thought of John Shirlow, his assistant. Good man, John. Couldn't be more than twenty-five, yet quite able to take over his job. Of course John hadn't had the experience yet.

He wondered if John would end up like him after thirty years in space. No home, no ties with Earth, no one to feel a moment's sadness after he was gone. Or pensioned off and put in a sanatorium as a mental case.

With a curse he slammed the metal desk. Who's insane? After all, he reasoned, he knew that she didn't really exist. Turning his mind away from the disturbing thought, he tried to remember what he

had been like when he was twenty-five. But memories are like books—if you don't use them they get stale and faded. Can't seem to get the pictures right, as though a few of the pages have fallen out and got lost.

Thinking of John again he began to wish that he could somehow warn him. Not in words, perhaps, but in some way which would prevent him devoting his life to the void. Of course, if he got married . . .

An idea began to form and he smiled softly. If he were to meet Sheila Stewart. Surely something would come of that. A rich young woman travelling home to Earth after visiting her father on Vellus, and he owned a cilium mine worth millions. What more could a man want? Apart from the fact that she was beautiful.

His thoughts were interrupted by the approach of footsteps and, with a sigh of relief, he began to gather up his odds and ends. She probably wouldn't even look at him.

"Evening, Bill. Everything all right?" asked John Shirlow.

"We're moving, aren't we?" he answered, grumpily.

"Just asking."

"Oh, by the way, John," he said, turning at the door, "have you met Miss Stewart yet?"

The question had been asked out of curiosity, in the vague hope that, perhaps, he had met her in the mess. He was wholly unprepared for the mixture of emotions that swept across John's face.

"What if I have?" John finally blurted. "I may be only a junior officer, but I'm entitled to speak to the passengers . . . even if she is very rich and . . . and very . . ."

"Fine, fine," Bill cut in. "Only wanted to know. Otherwise I would have introduced you."

On the way back to his cabin Bill gloated over the incident. Obviously John had fallen for the girl. Why else would he become so embarrassed, and then so angry? He was still thinking of ways and means when he climbed into his bunk and switched off the lights.

It seemed that his eyes had hardly closed before someone

was shaking his arm and calling his name. Coming wide awake, he glanced at his watch and saw that he had been asleep for three hours.

"What is it?" he asked, impatiently, giving the crewman a hard glare.

"Mr. Shirlow would like to see you immediately, sir."

In a moment he was out of bed and pulling on his clothes. This was the first time John had ever called for him and that meant an emergency. And an emergency meant . . . He thrust the thought away and hurried from his room.

John met him at the door, and it was obvious from his expression that something was wrong. Without wasting words he led Bill to the instrument panel and pointed to the dials.

"The pile isn't functioning correctly, sir."

"Isn't functioning correctly!" Bill shouted. "The damn thing is twelve degrees above safety. How the devil did this happen? Another couple of degrees and we'll go off like a nova."

"I . . . I'm to blame, sir," John said, unsteadily.

"Obviously!"

"I was talking to Sheila when I should have been watching the instruments."

"Sheila Stewart? In here?"

"Yes, sir."

"You realise the consequences of this?"

"Yes, sir."

"I'll attend to this matter later. Right now we've got to stop the radiation from increasing. Already there must be enough excess in the fission chamber to produce a near critical state in the pile."

For a moment he studied the instruments carefully. Even as he watched, the gauge showing the amount of radiation in the chamber crept another degree higher in the red margin. With a decisive movement he pushed all the switches over to the "off" sign.

"But, sir . . ."

"Shut up," he snapped, feeling a deep sense of failure as the scream of the engines gradually descended the scale until silence hung uncomfortably over the room.

Operating the visa-screen, he waited impatiently for the

connection with the control room. The screen cleared to reveal the face of the first-lieutenant. "Get me the captain," he said, urgently.

"What's the meaning of this, Kane?" bellowed Captain Sanders as soon as he saw who was calling. "Why has our power been cut off?"

"Because if I'd allowed the fission motors to run for another ten minutes we would have gone off like an A-bomb."

"Oh . . . How long will it take to repair?"

"I'm not sure, sir. It will take about a week for the chamber to cool."

"What! Don't you realise that we are in an orbit for Earth and should reach it in three days? If you haven't got the drive working by then we'll go right through the ruddy planet."

The captain's complexion grew noticeably darker upon the screen and his voice rasped harshly on the already taut nerves of the engineer.

"I'm perfectly aware of that, sir," Bill said, angrily.

"Then do something and report to me in an hour."

"Well, Mr. Shirlow," Bill said sarcastically, after the screen had gone blank. "Perhaps you can give me a suggestion, seeing as how you got me into this mess."

"It's the pile isn't it?"

"Yes, it's the pile."

"It'll have to be re-set in the shield so that the electron flow can be adjusted?"

"Brilliant, Mr. Shirlow. What powers of perception you do have. But in case you don't know yet, one has to enter the fission chamber to re-set a pile, and with the radiation at the level it is now there isn't liable to be much left of one when one comes out."

"If you'd been on the job," continued Bill, fiercely, "instead of playing about with that Stewart girl, you'd have noticed the increase in radiation and shut off the motors. Then we could have put suits on and gone into the chamber, but now . . . with all that radiation in there . . ."

John frowned. "It's obvious that the pile must be re-set before tomorrow in order to give us time to decelerate, so I'll go into the chamber tonight."

"Don't be a damned fool," Bill roared. "It's suicide to go in there for at least a week. There must be a way."

Turning away from the instrument panel he walked over to the window, gazing moodily at the glittering stars. He couldn't really blame Shirlow. It was one of those things that happened once in a lifetime. Some particle of foreign matter in the fission material and a quick change in vital mass. A rise in the potential radiation output and in a matter of minutes the excess radiation is building up in the chamber and playing hell with the finely set pile.

"We'll have to take a chance," he announced a moment later, swinging briskly from the window and staring at the white-faced Shirlow. "This part of the ship is shielded against radiation, so we can seal the doors and open the fission chamber by remote control. After that we'll just have to keep our fingers crossed and hope that the radiation expends itself in this room before tonight."

"It might work," exclaimed

John, his face lighting hopefully.

"It's got to work. You clear out our gear and fix things up so that we can operate from the control room. I'm off to see the captain."

He was at the door when John stopped him.

"Bill, does this mean a court martial?"

For a moment he was tempted to scare the pants off the lad, but the tight lipped mouth and steady gaze took the hardness out of him. "No, John, it could have happened to anybody. I could throw the book at you, but instead I hope that in future you will realise that regulations are made for just such an emergency as this."

The gratitude in John's eyes made him feel uncomfortable and with a grunt he left the room.

With the captain's approval he sealed the engine room doors and opened the fission chamber. The readings from the control room weren't very hopeful, and with a worried frown he returned to his room.

"Mr. Kane?"

He turned at the sound of her voice as he was about to enter his room. "Yes?"

"I just wanted to thank you for what you did today," said Sheila Stewart, her eyes resting gratefully upon him.

"You mean John?"

"Yes. Not many men would have done that."

"That's right. The trouble with me is that I'm getting soft in my old age."

"No, Mr. Kane, not that. Understanding perhaps."

"You like John?" he asked, quickly changing the subject.

"Yes."

"He'd be good for you."

The blood mantled her cheeks under his gaze. "I know."

"I wish I'd been in his shoes when I was his age."

"Thank you, Mr. Kane," she answered softly. "Thank you for everything."

He watched her as she walked down the passage, blonde hair bouncing on smooth, rounded shoulders. "Yes, I certainly do," he thought as he went into his room.

The time passed slowly for

the next ten hours. He tried reading a book, watching a film, listening to music. All to no avail. By the time the ten hours were up the room was filled with tobacco smoke and his feet ached from pacing the floor. With a sigh of relief he made his way to the control room.

"How is it?" he asked John as he entered the room.

"Not too good, still much too high."

A quick look at the indicator and he knew that John was right. The engine room was a death trap, even in the heaviest suit.

"I'm going in there," announced John, starting to move across the room.

"On whose orders?" Bill roared. "You forget yourself, Mr. Shirlow."

John stopped and came stiffly to attention, going a deep red as the other officers in the room looked on.

With a brief look around, Bill made his way to the door. Somehow he had known the outcome of this all along. Strangely enough he was thinking of the girl out there

in the void as he made his way down the long passage.

"Let me go, Bill," pleaded John, coming up behind him.

"No," he answered, shortly. "Give me a hand with this suit."

The shielded suit used for making inspections of the fission chamber was a heavy and uncomfortable attire. With the helmet in his hand, he paused and gripped John's shoulder.

"It's better that I go, John. You may not be able to handle the job, and besides, I've about run out of time anyway."

"No, Bill," groaned John. "It's all my doing; you must let me go."

Bill paused, wondering how he could convince him. "You mustn't look at it that way. These things happen and that's all there is to it. But I would like you to take some advice."

"What's that?" asked John, hollowly.

"Marry her. Don't let her go out of your life. Marry her quick!"

Turning away from the stricken man, he slipped on the helmet and stripped the seals

from the door. He paused for a moment to glance behind, but John had left. Then he was inside the engine room.

His geiger counter began to chatter excitedly as soon as the radiation penetrated his suit, and after a moment's hesitation he disconnected it. As far as he could work out he could stand about ten minutes in the room. After that there would be no hope left.

Thirty minutes later he slipped the shield back into place and sealed up the fission chamber. His movements were sluggish and he found it difficult to think. The realisation was with him, however, that he hadn't very long to live.

With an amused smile he took off the useless suit, put over the control switches and watched contentedly as the scream of the motors rose in crescendo and the little black needle hovered steadily in the safety margin. Switching on the visa-screen he cut out the vision with a thought to his friends in the control room. His face wouldn't be very nice to look at.

"Captain?" he asked briefly, and watched the relieved face appear. "The pile's O.K. now; you can go ahead from the control room. I'm afraid you'll have to seal this room off though. It'll be too dangerous for a week or so."

"What about you?" asked the captain, slowly.

"I've had it. Better seal me off as well."

"I'm sorry, Kane, very sorry." His voice broke and he moved away.

"Cheerio, John," Bill called, as the young man appeared on the screen. "And remember what I said."

He switched off before John could answer, feeling unable to carry on the pretence any longer. He was scared. Scared almost out of his mind at the knowledge that soon he would be face to face with death.

Slowly he dragged himself over to the window, hoping to find comfort out there. Suddenly he lifted his head. It was the music!

She came at him with a smooth, almost sinuous grace. No longer staying beside the ship, but moving towards him with a strange eagerness. Her black hair gleamed with lustrous beauty and red lips parted in a smile that revealed strong, white teeth. The loneliness was gone from her face and now stars of laughter danced in the jet of her eyes.

No word passed between them, yet in that moment more was said than a million words could accomplish. With a vibrant happiness surging through him, he stepped through the window and went out to meet her.



FICTION

Three titles came one hard upon the heels of the other recently from Sidgwick & Jackson (44, Museum Street, London, W.C.1). Although all three are labelled as science fiction, yet only two of them really meet this description. *CHILDHOOD'S END*, by Arthur C. Clarke, (10s. 6d.) is well in the tradition of science fiction and is probably the most mature novel yet from the prolific pen of this author. Told with power, sincerity and great depth of focus, this story tells of the subjection of Earth by beneficent visitors from the stars. There is no melodrama here.

The Overlords, as the star visitors are dubbed, merely hang in the sky and watch, interfering but little and then only to make life easier for the majority of Earth's population. The fact that they are so idle makes men suspicious.

Why have they come? What is their purpose? Just what is it all about? The Overlords admit to having a purpose but they do not disclose it until it really discloses itself. And here, where the idea involved is tenuous but powerful, nebulous but assuredly concrete, the author fails to control his own creation completely. Probably all authors would.

But, though this partial lack of integration tends to make one dissatisfied with the last section of the book, there can be no doubt that *CHILDHOOD'S END* is a major contribution to science fiction. This is the only Clarke book published in Britain that we highly recommend, and we recommend it very highly.

The second S & J title is *THE GREEN HILLS OF EARTH* (9s. 6d.), a collection of stories by Robert Heinlein, reprinted from the American

anthology that was reprinted from the magazines in which the stories appeared. So many reprintings should testify to the stories' worth. They *are* worthy. Each of the ten stories in this volume without doubt deserves the permanent form which has been conferred upon them. Another high recommendation for this one.

Thirdly, from S & J we have *HOLE IN HEAVEN* (9s. 6d.), by F. Dubrez Fawcett. This book is most disappointing. The publishers have tried the experiment of getting established authors in other fields to turn their hands to science fiction, and *HOLE IN HEAVEN* is the first in the series. It is not science fiction. It is not a good story. It is not well written. This is unfortunate because it might predispose the reader against the rest of the series, and *they* might be good.

Angus Wilson, who is editing this series, says in his Note that science fiction in general exhibits a dearth of real characters and that one of the aims of this series is to produce science fiction *with* real characters. Reading the book, one feels that the author has been given a brief, a blue-print that he valiantly strives to transmogrify into a story—and

lamentably fails. Every character in the book is stock, made of cardboard, reached down off the selves of ready-mades that form part of the hack writer's equipment. Fawcett is not a hack writer, of course. In trying to meet the conditions laid down for his story, he has tried so hard that he has overreached into the hack-writer's domain. The plot is a badly formulated pseudo-fantasy that harks back to the pulp weird formulas. It is developed dully and tritely. Maybe the whole idea of the series is ill-conceived. However, the author cannot be excused for the incredible mistakes in his description of life in a Cottage Hospital and the medical fraternity generally. Regretfully, not recommended.

BEACHEADS IN SPACE is a collection of stories edited by August Derleth and published by Weidenfeld and Nicholson (7 Cork Street, London, W.1) at 9s. 6d. It contains seven stories, by five American and two British authors. The quality is somewhat mixed, as is often the case with Derleth collections. On the whole, however, the lowest quality stories are still good enough to just deserve preservation between boards. The best

ones—such as Asimov's *Breeds There a Man . . . ?* and Wyndham's *And the Walls Came Tumbling Down*—without question merit anthologizing. Not quite in the first class, but recommended all the same.

Rupert Hart-Davis (36 Soho Square, London, W.1) continue their championing of Ray Bradbury with his *FAHRENHEIT 451* at 9s. 6d. By any other author this would be an outstanding book, but it lacks the stamp of Bradbury. Indeed, it could have been written by another author. That cannot be said about Bradbury's previous books. It seems that Bradbury is not happy in the novel form; his peculiar manipulation of words and ideas is suited best by the shorter pieces.

Nevertheless, if one is out for a good story and will not be disappointed by the fact that it is not in the Bradbury manner, then *FAHRENHEIT 451*

will fit the bill. The title is said to be the temperature at which book-paper catches fire and burns. This is a bit of dramatic license with facts, but justifiable probably. In its original appearance in *Galaxy* this story was a serial called *Fireman*. It follows the episodic career of one Montag, a fireman of the future whose job is not to put out fires but to start them—by burning books which are illegal. He begins to wonder whether books might be good things after all, or at least harmless. Such thinking is treachery, of course, and it is not long before poor Montag is discovered at the awful crime of reading a book. He is hunted down for the rest of his life, comes into contact with others with the same feelings, and so on. The basic pattern is unoriginal. Nonetheless, it is an exciting book and very well worth reading. We only wish Bradbury had used a pen-name!

NON-FICTION

OUR MOON, by H. Percy Wilkins, F.R.A.S., is published by Frederick Muller (Ludgate House, Fleet Street, London, E.C.4) at 12s. 6d. There is a Foreword by Dr. J.

G. Porter. Mr. Wilkins is the Director of the Lunar Section of the British Astronomical Association. He spent sixteen years in cartographic study of the Moon, resulting in what is

now the standard map of that body. He spent some time at the Meudon Observatory working with the 33" refractor telescope in association with D'Azambuja, Bertaud, Dollfus and Hermann. This book is a popular account of his studies. Seldom does a book about the Moon read as interestingly as this one. Usually, the books are as lifeless as their subject, but here we have something very different. Here we see that though the Moon is so near and has been mapped with such precision, yet there is a considerable number of unexplained features associated with it. Nicely illustrated with photographs and drawings, the book is not least notable for a preliminary account of the other side of the Moon, based on data concerning the visible side.

Strangely enough, this data is in itself unexplained, for it is the rays that radiate from various points on the Moon. Nobody knows what these are, though there have been several intelligent guesses.

This book is highly recommendable to the reader who wishes for a non-technical account of our nearest celestial neighbour, and will not be altogether superfluous for

the more knowledgeable specialist.

MODEL JETS AND ROCKETS FOR BOYS (8s. 6d., T. Werner Laurie, 1 Doughty Street, London, W.C.1) is a reprint of an American book by Raymond F. Yates. The title explains what it is all about. For the serious model maker who is interested in rockets and jets, this is really a "must," for it surveys the whole field in a thoroughly practical fashion. It is our surmise that the "FOR BOYS" could have been dropped from the title!

Written in the free-flowing, idiomatic American style, the book nevertheless approaches seriously every aspect of its subject. It starts with a brief history of rockets, goes on to outline the basic principles of rocket and jet construction and then devotes a fair space to laying the groundwork of simple model construction. The second half of the book covers more advanced work for which the first half serves as basic training. Here in the second half the author deals with the high speed flying wing, jet engine installation and operation, and the Jet-master and Augmenter Tube. One hundred and fourteen illustrations make clear every-

thing referred to in the text.

It could be that some of the equipment dealt with is not available in Britain and would, therefore, be difficult to obtain. But the Jetex series of rocket motors is certainly available. Once again, we say that this book is essential for all model enthusiasts.

The second edition of *ROCKET PROPULSION* by Eric Burgess (21s., Chapman & Hall, 37 Essex Street, London, W.C.2) has now appeared. The first edition contained a number of errors which have now, it is said, been removed, and the material on rocket motors has been made more up-to-date.

Mr. Burgess has for long been associated with the British Interplanetary Society, and now holds a place on the Council of that body. He is also an Honorary Member of the Pacific Rocket Society.

His book is beautifully produced and exceedingly well illustrated. With the present spate of books on this and

allied subjects, there is almost bound to be a certain amount of overlapping. Unavoidably, therefore, *ROCKET PROPULSION* covers a good deal of ground that is quite adequately dealt with elsewhere, but, even so, it is covered from the particular point of view of this book and is thereby justified.

Ranging from general principle of rocket propulsion, through fuels, motors and design problems, to full-scale spaceships, the book is written in easy-to-follow language that is probably due to its being based on a series of lectures the author has been giving over the years. In places it is rather hard going, but such is inevitable with this complex subject. A set of mathematical appendices sets out the basic theory for those who wish to dig deeper.

While the first edition could not be recommended because of its errata, this second edition can be warranted as a comprehensive coverage of the field.

Maybe Freud was right. Perhaps the subconscious can make us forget little things like posting letters—and buying petrol . . .

THE BRIDGE

by LEN SHAW

LATE AGAIN!" thought Mr. Trinter morosely. "I always oversleep after that damned dream!"

Pale-faced, he stared round the dingy dining room. He sat at table, at the one place where orderliness was unimpaired by gastronomical activity. He poured milk on his cereals. Ate without relish. Then a maid entered carrying a tray, and he looked up, sheepishly, and down again.

"'Morning, Mary."

"There you are, Mr. Trinter—at last!" Mary glowed good-humouredly, bringing the late arrival a cup of tea. "Thought you'd never come down. Was it——?" Her eyes questioned Mr. Trinter's bowed head.

He pushed the empty plate away. Nodded. "Unbearably real, too!" he shuddered. "Ugh..!"

"It beats me!" Laughing,

she brought the egg. "You live so quietly, yet you have that nightmare. While I——"

"D'you dream?"

"Of course."

"Often?"

"Every night. Regular as clockwork."

"What about?"

"Well, really, Mr. Trinter!"

Blushing, Mary began collecting dishes. "I don't think I ought to tell you. Besides," she looked warily at the door, "I mustn't waste time talking to the lodgers—according to Mrs. Skipson." She tossed her head. "But what the eye doesn't see——"

"—the heart doesn't grieve over, eh?" Mr. Trinter chuckled, brightening. "These dreams," he resumed, intently decapitating his egg. "No prying, but—are they pleasant?"

"Mmm!"

"You would have expected—unpleasant dreams?"

"Well, yes. I'm always having trouble." Mary's sigh was not devoid of satisfaction. "Young men are so demanding. They all want me to love them till death us do part. But I want to ring the changes. Make sure I know what I want. So they're always quarrelling. And one," Mary thrilled, "threatened to kill me if I didn't marry him on the spot!"

Mr. Trinter glanced at the girl. She was well-built, healthy. She radiated vitality. And she had common sense and humour. He sighed, envying her belligerent suitors.

He pulled himself together. "No details, but—your dreams are romantic? Prince Charming, and all that?"

Mary's cheeks burned.

"I bet," his eyes narrowed, "you don't know what his face looks like!"

"My goodness, no!" she gasped, round-eyed. "How did you guess?"

"Shot in the dark."

Mr. Trinter smiled. This chap, Freud, now. He'd got something. Mary was a ro-

mantic. According to Freudian interpretation, her dream was wish-fulfilment, and when Mr. Right came along, the dream-lover would acquire recognisable features.

He frowned. His own dream was much more complex. With the real meaning—latent content, as Freud would have it—completely obscured by the symbolic manifest content; and the censor, probably, gumming up the trail. Yet somewhere, fathoms deep . . .

"It's a tough nut!"

"Your dream, Mr. Trinter?"

He started. He had spoken aloud; and Mary, a full tray on her hip, was watching. She came over to his chair.

"If you like," she offered, "I'll lend you my Book of Dreams."

"Dreams . . .!"

An acid voice maltreated the word, and in swept a tall, hook-nosed woman, grey eyes flashing behind pince-nez.

"You're not paid to dream, Mary. Hurry up. There's a stack of dishes in the sink."

"Yes, Mrs. Skipson."

Demurely, Mary went out, and the landlady, rigid and righteous, addressed the

lodger. Her smile was as mean as an east wind.

"Late again, Mr. Trinter?"

He dabbed his mouth. Folded his serviette. Lit a cigarette. "One of these days," he thought, "I'll crown the old gorgon." When late, he generally apologised; but this morning she'd got his back up and he wasn't going to. He'd be hanged first. His eyes strayed through dingy Nottingham lace. He saw walled garden. Flooding summer sunshine. Azure sky. He stared at his landlady.

"Nice day . . ."

"The B.B.C. forecasts thunder." Mrs. Skipson sniffed. "But that's beside the point. You're wanted on the 'phone."

Mr. Trinter drove westwards towards mountains instead of down to the familiar southern plains.

"This," he grouched, "is just dandy! Thirty years' faithful service, man and boy. Then they do this on me."

He ignored blazing sun, green hedges, lush meadows, goldening corn. His week had been nicely planned. In the back of the car, the autumn

styles, numbered, orderly. Finest range ever. Sell themselves. So go down south, along the coast, back a different way. Circular tour. Seventy—eighty calls. All good customers. Prospectively, a bumper week.

Then—that 'phone call.

"Ah, Trinter . . ." Breezy accents identified the tycoon—Cyril Quant, Managing Director of Quant and Quilp (Knitwear) Limited. "Glad I caught you. Nasty accident. Poor Wallis!"

"Oh?"

"Lost an argument with a 'bus. He was on a special job. I want you to take over. Yes—today. Here's Miss Peabody. She'll give you the gen. Goodbye—and good luck."

Mr. Trinter's knuckles whitened. The old buzzard! Kicks you in the teeth and expects you to like it. But he had not protested to Miss Peabody. If you held your tongue, you held your job. So now he was heading into the wild—and, to him, unexplored—heart of Wales. Moment's-notice mountain-eeering. All because he'd been late for breakfast.

He hadn't deserved—this. Damn that dream. It was quite enough to stomach—black iron bridge, eerie sunshine, swift tumble towards turbid waters—even if it was only a dream.

Unvarying, horrific, it spread terror bowel-deep; but it had no meaning. None, at least, that would yield to Freudian interpretation—unless it was censor-distortion which had baffled him; and there was, truly, nothing else it could be. So tonight he would put his thinking-cap on. Have another crack at the conundrum.

A magpie, hedge-hopping, brought Mr. Trinter back to earth. He had been steadily climbing. He was well into unknown territory.

The view was panoramic. A wild plateau. Coarse grass clumps, boulders, hillocks. Ragged copses. Scattered sheep grazing. A stream paralleling the road—a liquid-silver snake, leaping and sparkling. Lightning flickered over distant mountains, black-capped by thunder cloud.

Mr. Trinter's spine chilled. Primitive grandeur was not

his cup of tea. Patchwork fields, symmetrical copses and spinneys—the easeful southern contours were for him. He puckered his lips.

"Still... Shouldn't grumble. Getting out of the rut . . . Once in a while, it does you good."

The engine coughed. Spat. Died.

He swore, eyeing the gauge. The needle pointed to "empty." He said: "You're a liar!"

Disbelieving, he swore again. A dry tank was inconceivable. Only once, years ago, had it happened. Since then, he had never forgotten. Get in car, switch on, check petrol. It was routine. Automatic. Instinctive.

He checked again. The needle insisted. He switched off. On. The needle merely twitched. "Empty," it said. He had to believe it then.

Scowling, he remembered. Getting the car after breakfast. Checking. Petrol low. Deciding to stop and fill up at the first garage. But he hadn't stopped.

"What the devil!" he puzzled. Heat-shimmer rose from

the radiator. He removed his hat. Mopped his brow. "Forgetting the petrol. Me! Must be going crazy!"

Not too crazy, though, to size up the position. Nothing—human or mechanical—on the road. A few tiny cottages, white diminishing dots beside the road—no help there. Then a remembered rusty pump, just inside a farmyard. Two miles back? Three?

He shrugged. Climbed onto the road. Walked to the rear of the car—and kept on walking.

He drove on, two hours later. A hard-bargained two gallons splashed in the tank. Enough to reach Llancurrig—a small town jewelling a mountain breast. "And on arrival," he promised himself, "a fill-up. You bet!"

He surged towards the mountain wall, darkened by the crouched, flickering thunder-beast. His gaze shivered to a brighter perspective. Sun-drenched plateau. Glad stream—clear, swift, sparkling. He hummed a joyous tune. A hump-backed bridge

ran towards him. Up, over, down again, with a lift and twist of his stomach. He fell silent, thinking of his dream.

It was, mercifully, brief. Driving, he faced the bridge: which was a symbol for—what? An envied goal? Barrier to desire? Unconsummated ambition? And eerie sunlight on shiny black iron-work. That quality—eeriness! What of it? Why eerie? The fall towards tortured waters. Set-back? Defeat? Disaster? The end of life itself?

No answer—yet. His existence was ordered. Accepted. Without forward-striving. Yet the dream had meaning. Caricatured, deep-laid, subconscious realities. But censor-distortion falsified everything. Sly, subtle, jumbling, herring-trail-laying censor. If he could lay a finger on its working—

He passed a signpost. Two miles to Llancurrig. He would be there, on the mountain's lower slopes, by two-thirty. "The Fashionable" (Mr. P. Grubbiner, Proprietor), the leading millinery establishment, was his target. If he didn't get the biggest order yet—

"Ah!"

The breath left him. His hair bristled. There, through the windscreen, the bridge of his dreams!

A millisecond later he jammed his foot down. Pulled the handbrake. Locked the wheels.

The car screech-stopped, nosing onto the bridge. In a flash Mr. Trinter was out, behind it, sweating and shaking.

He laughed afterwards. Brown bridge, not black. Spanning railway, not river.

One person watched, standing fifty yards beyond the bridge. Big, quietly-dressed, the sun high-lighting his polished cranium, he peered towards the car. Self-conscious, Mr. Trinter went back and slipped behind the steering wheel. When he looked through the windscreen, the man had vanished.

He drove across into Llan-currig. The High Street rose before him, steep, shop-lined. Double-fronted. "The Fashionable" was on his left. Pulling into the curb, he got out.

The big man with the polished cranium emerged, looking concerned. He stared over the opposite roof tops. Mr. Trinter stared too.

Behind nestling habitations up rose barrier mountain. About cloud-enveloped summit, lightning flickered, thunder rolled. Mr. Trinter shivered, despite muggy mid-day heat. He met the big man's solemn look.

"Pretty black up there."

"Aye. There's a storm in the mountains. Trouble brewing for someone."

Raindrops beat a smart tattoo. Sunshine was wiped off the street.

Mr. Trinter cleared his throat.

"Mr.—er—Grubbiner?"

The big man cocked a last troubled look upwards. "That's right," he nodded. "Come on inside, Mr. Trinter."

The shop had an air. Spaciousness. Dimness. Gentility. The faded elegance proper to a high-class provincial establishment. The staff were at lunch, so Mr. Trinter had shop and proprietor to

himself. Mr. Quant had already 'phoned Mr. Grubbner, so the men settled down to business at once.

An hour later, Mr. Trinter snapped his order book shut. Talk about a bumper order! But there was more to come. Planting his elbows on the counter, Mr. Grubbner pulled an ear. Cocked an eye.

"About delivery——"

"Two months. Guaranteed."

"Settlement?"

"Month after delivery. Ten per cent. discount."

"I'll pay now—and take fifteen."

Mr. Trinter thought swiftly. He had no authority to vary terms; but he was expected to show initiative. An extra five was too much. He compromised: "Make it twelve and a half."

"Done!"

Mr. Grubbner retired to his office to make out the cheque, and Mr. Trinter put his samples back in the car. As he finished, the big man joined him on the pavement, handing over the cheque. He stared at the mountain top and shook his head.

"Look at it. Yet there's hardly a spot down here."

Mr. Trinter followed his gaze and didn't like what he saw. He began: "Looks pretty grim——"

"Mr. Grubbner!" An assistant dashed out. "You're wanted on the 'phone!"

The shopkeeper shook hands and went inside, leaving Mr. Trinter, pothery with heat, mopping his forehead. He glanced at the cheque, put it in his wallet, blinked, took it out again and scrutinised it in astonishment. It was not signed!

Frowning, he put the wallet away and went back into the shop, cheque in hand.

"Damn, damn, damn!"

Facing Mr. Trinter across the office desk, Mr. Grubbner squirmed as he stared at the cheque lying between them. "Sorry! Error of omission. I do that sort of thing—where money's concerned." He paused. Leaned forward tensely. "Ever read Freud?"

Mr. Trinter's eyes widened.

"Well—yes."

"Then I can explain. You won't think I'm pulling a fast

one. Now why," Mr. Grubbiner spread his hands, "d'you think I didn't sign that cheque?"

"You—forgot?"

"On purpose!"

"Eh?" Mr. Trinter peered at the triumphant grinning face. Not long ago he'd questioned his own sanity. The boot was now on the other foot. "You forgot—intentionally?"

"That's it."

"I don't——"

"Let me explain." Mr. Grubbiner settled back in his chair. "Suppose your conscious mind and your sub-conscious have a difference. Consciously you want to do something. Sub-consciously you don't. Well, presently, when you find you haven't done it, you say you forgot it."

"That's right."

"Rubbish! Your sub-conscious has been at work. It made you omit to do whatever it was. See?"

"Well——"

"Take me. Brought up the hard way. Rags. Crusts. Kicks. So now what do I value most? Security! Money piled on money piled on money.

What do I hate parting with? Money!"

"But business——"

"Exactly! I'll honour my debts—consciously. Hence the cheque. But the old sub-conscious was working. It tricked me. I forgot to sign."

Mr. Trinter raised a sceptical eyebrow.

"Far-fetched, eh, Trinter?"

Mr. Grubbiner chuckled. "Well, consider the ways I've dodged paying money—thanks to my sub-conscious. Once I posted the month's accounts—and never took the cheques out of the cheque book. I've posted unsigned cheques. I've taken letters to the post and forgotten to put them in. And what d'you think happened to the biggest I ever made out?"

"No idea."

"Got it back next morning—addressed to myself."

Mr. Trinter laughed. "Maybe there is something to be said for your theory."

"You bet. Look——" Mr. Grubbiner hunched over the desk, face eloquent, hands outspread. "I've got a wonderful memory. Don't make notes. Don't need reminders.

Don't forget anything—unless money's involved. Then watch out. Things go haywire—— No!" He whacked the desk. "The sub-conscious wins every time. And, by the way——"

"Eh?" Mr. Trinter stared at an accusing, jabbing finger.

"Just what," demanded Mr. Grubbiner, "was biting you when you arrived in Llan-curig? You shot out of that car like a rocket. Never saw anything like it!"

"A trouble shared is a trouble halved," said Mr. Trinter, thankfully, and told Mr. Grubbiner about his dream, and the shock the bridge had given him.

"I should think so!" sympathised the milliner. "I dabble in psycho-analysis myself. I'm a bit of an expert on dreams. The Freudian theories——"

"D'you believe them?"

"Broadly speaking—yes."

"All of them?"

"Well, Freud's dream interpretation is hot stuff—as far as it goes. Doesn't cover every type, though. Not to my way of thinking. Doesn't cover yours, for instance."

"Mine?"

"Unusual type, yours. Pre-

cognitive. Dream of a future event."

"Impossible!"

Mr. Grubbiner raised an eyebrow. "Have you ever," he asked, "given thought to Time?"

"Well—no."

"You should. To explain your dream."

"Really?"

"Aye," growled Mr. Grubbiner, stroking his jaw. "Queer stuff, Time. There's lots of theories. One has it that all time is co-existent and—oh, damn!" He picked up the shrilling 'phone. "Hello! Who is it?"

Shortly, he rang off again.

"Sorry." He got up. "Spot of bother at home. I'll have to pop along." He shook hands. "Pity. I was getting warmed up. We might have done something about that dream. However—you're going on through Garthinion?"

"Yes."

"Good!" The men went through the shop. "There's a bookshop there. Name of Sykes. Go in and buy *An Experiment with Time*, by Dunne. It's tricky, but it repays study. Might give you some ideas."

"Well—thanks."

"We'll discuss that dream next time you call. And—oh, damn!" Mr Grubbiner snapped his fingers. "There was something else, but it's slipped my memory. Anyway, it'll keep." On the pavement he shook hands again. "Well, goodbye and good luck!"

Mr. Trinter got into the car and drove off. Brooding. Trying to visualise all time as co-existent.

He did not see Mr. Grubbiner dash out onto the pavement, jump on a bike, and pedal, hell-for-leather, after him, shouting and waving.

An hour later, in Sykes' bookshop, Mr. Trinter bought Dunne's *An Experiment with Time*. He drove off, and, about a mile out of town, parked on a grass verge and opened the book. Soon he was enthralled by the exposition of the incredible properties of time.

He looked up, startled, as heavy raindrops drummed on the car. Black was the sky. Vicious the lightning. The thunder-crash instantaneous. The heavens opened. The rain bucketed down.

Driving like one possessed, he got ahead of the storm, which, after reaching out an arm in black, lashing fury, withdrew noisily to the hills. For no reason at all, he thought of petrol and looked at the gauge.

A falsetto laugh escaped him. He'd forgotten it. Again. Twice in one day . . . !

"I'll fill up," he swore, "at the next pump. And get the tyres checked too. The old crate's all over the road."

Luck, he decided, was not entirely fickle, for there was a one-man petrol station round the next bend—although, as he drew up, rain deluged down again.

An old man came running. Shouting instructions, Mr. Trinter snatched a few more minutes with his book; and, when the attendant reappeared, thrust a fiver into his hand. The man gave him an aggrieved stare, then vanished in the rain. He read on, absorbed, until an oily hand thrust his change under his nose. He put it in his pocket, closed the book reluctantly, reeled up the window and drove on. Before he had driven

a hundred yards, he was in brilliant sunshine again.

He settled down to a steady fifty-five. The road was good. Mountain and storm were behind him. He still had two or three more calls, but at least he was heading for home.

For five minutes he relaxed. Comfortable. Enjoying the run. Then, rounding a bend, he jerked upright, pop-eyed with terror. A hundred yards ahead, up a slight incline, was—the bridge!

This time there was no mistaking it—the black shiny ironwork, the eerie sunlight spilled slantwise on the broken bridge through a ragged hole in the fugitive cloud-wrack. Gripped by paralysis fear, musclebound, he kept the accelerator down. The car surged forward.

Then the engine cut out. Dead weight dragged against momentum. Speed slumped.

The spell broke then. He shut his eyes. Jammed the brake hard down. Skidded to a stop scant inches from disaster.

Sweat-drenched, trembling, he got down and went to the ragged edge. Far below, turbid

water sucked and snarled at twisted ironwork.

Turning suddenly, he was violently sick. At the same time, he couldn't help wondering why his tank was petrol-less.

Mr. Trinter drove gingerly back on borrowed petrol. Mentally and physically he felt jaded. Beaten. For the time being he had no further interest in Freud or Dunne. Tomorrow, maybe; but now he just wanted to get home and go to bed.

He pulled up at the one-man petrol station. This was the place where you bought five gallons—and ran out of juice a mile further on! He sat seething till the old man appeared; then, red-faced, let fly with verbal vitriol.

The old man listened in deepening perplexity, and at length boiled over.

"Are you crazy?" he shouted back. "You paid me with a fiver, didn't you? Why didn't you count your change? Four pounds nineteen and six for you, and sixpence for me—for checking the tyres, Mister. You never said a word about petrol!"

MARCH OF SCIENCE

NEWS OF SOME RECENT SCIENTIFIC DISCOVERIES

C. DE JAGER, of Sterrewacht Sonnenborgh, Utrecht, decided to measure the width of certain hydrogen lines in the solar spectrum. As a result of what he found it is possible that present ideas of the structure of the photosphere will have to be greatly modified.

Jager discovered that the lines were much wider than would have been expected from the application of certain statistical calculations based on the effect of ions surrounding emitting electrons. Since it is not possible to ascribe the widening to atomic processes, the explanation must be that there is a process going on in the photosphere that is not reproducible in the laboratory.

From results he obtained by constructing models of the solar photosphere, Jager believes that the widening is

caused by microturbulence in this layer of the Sun.

★

THE PERIODIC TABLE of elements can now be set out with a nice round number, for Element 100 has been discovered. It was produced artificially by the same people—Professor G. T. Seaborg and his staff—who made Element 99, the discovery of which we noted recently.

The precise details are not available and may never be, but we can give the rough outline of this new element's genesis. Using apparatus at the University of California, Seaborg and colleagues prepared Element 100 from something like plutonium-239 by repeated capturing of neutrons followed by beta-decay. The first process increases the mass, the second increases the atomic number.

So far the new element has not been named, but a few of its properties have been described. Chemically, it behaves like erbium, a rare-earth metal in the same group as the new one. It has a mass of 253 and a half-life of somewhere in the region of three hours.



AN INDICATION of the interest that orthodox science is showing lately in paranormal matters is the Perrott Studentship in Psychical Research tenable at Trinity College, Cambridge. The Studentship, which is open to anyone who has completed his or her twenty-first year at the time of election, is awarded to the applicant who, in the opinion of the Electors, is most capable of carrying out research, in consultation with a Supervisor, on some problem of psychical significance.

For the purposes of the Studentship, psychical research is defined as "the investigation of mental or physical phenomena which

seem *prima facie* to suggest (a) the existence of supernatural powers of cognition or action in human beings in their present life, or (b) the persistence of the human mind after bodily death."

Such work as this, carried out as it is under controlled scientific conditions, will undoubtedly produce in the long run definitive evidence for or against the existence of extra-sensory phenomena.



THE CLAIM of certain fossil brachiopods to be the oldest examples of living things of which we have direct knowledge, looks as though it is about to be shattered. Fossil algæ have recently been found lying in a chert deposit beneath the iron ore bed of Lake Superior. The age of the iron ore layer has been estimated as 1,300 million years, and for the chert 2,000 million years. Thus these fossils seem to represent a form of life that existed farther back in the past than any other known remains.

THOUGH SWEDEN prides itself on its low incidence of crime, it has recently given to the world a totally new and powerful method of detecting finger prints. Workers at the Institute of Biochemistry, Uppsala, discovered that aminoacids, present in sweat, are always left on objects that have been touched with naked fingers, and that these acids persist for considerable periods.

They devised a technique whereby the aminoacids could be "developed" by spraying the object with a weak solution of "Ninhydrin" (triketo-hydrindenehydrate) in acetone and then heating at 80° C. for a minute or two. "Ninhydrin" produces a blue colouration with all but two aminoacid-type compounds.

It is claimed that this technique detects finger prints on

paper that has not been touched for twelve years. There can be little doubt that this method will be avidly incorporated into the routine of forensic science, especially those branches dealing with documentary evidence.

★

DISSATISFACTION with the results of the Michelson-Morley Experiment as a basis for so important a theory as relativity, coupled with the recent tremendous advances in microwave physics, has made several top-ranking physicists consider repeating the experiment under conditions which are likely to give results at least ten times as accurate as those obtaining under Michelson's conditions. So there is still a last word to be said on ether-drift!

More news from the frontiers of science next month—including the latest work dealing with Life on Mars!

How many meetings have there
been like this?

TRYST

by WILLIAM B. JOHNSON

UNDULANTLY she moves
beneath the trees. Alabaster is her skin.

Silk-like. Yet no silk compares with it. Mist wreathes her as she moves. A silver mist, a fitting garment. She is feeding on the leaves of trees which bend at her request and so make easier her meal. Loved by the trees. The boughs caress her flanks.

She is yet cloistered in sweet solitude, a maid, separated as by custom from others of her species that she might, communing with the earthly things, negotiate the steps from youth to adult powers. Tended by the trees and flowers about her. Grasses, pale as honey, bend suppliant that she might move upon them. Trees and grass and

warm flower blooms vie for the pleasure of her gentle touch.

She is beautiful. Her lithe and vibrant form is supple. A queen of unsurpassed and milk-white aspect. Meditating. Her body ripples as she moves from tree to tree. They supplicate themselves for her attention. Wreathes of star-like insects, softly glowing, move about her as she glides. Envied, they, by a whole world of other creatures. Empress of all nature, she.

Dim-glowing is the forested and rolling continent in which is her abode. Belayered by swirling mists that cling about it. She needs no light from sun or stars to show her obstacles. For she perceives all things—or almost all. An-

tennæ, vibrant on some microscopic insect, move beneath her loving scrutiny. Things monstrous: great and long-dead stumps of trees and monolithic rocks which might cause her some slight detour withdraw, swift-moving in the gloom, that she might flow past all unhindered. What need of colours is there when to goddess-like perception molecules within the contours of all things yield to her sight their close-held, veiled, atomic secrets?

Bodies heavenly: great, glowing, gaseous globes of energy beyond the silver-turquoise dim-translucent clouds of atmosphere about, above her are within her ken. She touches them with forces flowing from within her delicate frame. They pulse beneath her knowing fingers. Are titillated, proud, by her attentions.

She moves—and with a strange excitement—to effect a meeting. With thing of polished metal that with

brazen clangour of great gushing flame she has brought here for perusal. Child yet is she. Not knowing, quite, all things. She seeks in mystified ways some further and more intimate communion with new-swelling cultures of brave, hotly-spawning other worlds.

They are far off, on the continent on which she dwells. Exulting in their ingenuity. Unwitting that her will has brought them hither. Small, limb-appendaged creatures. Impatient, she, at last. With impatience of youth not quite full tempered in the furnace of experience. She would be at their side. In their immediate vicinity. She wills it. It is so.

She moves with liquid glidings in their field of vision. She well knows of their faculty of sight, their outward looking eyes. They see her. With jaws all pendulant they now perceive her. Unsubtle, ganglionic brains within their hair-thatched cranial cases. Full simple, they. She knows it.

Loved they are by her in their simplicity. And drawing near to her.

Galvanic, impulse-motored limbs they have. Uncomplicated nervous systems. She feels of them and wonders, loving them so made. They ring her round, puny, near her.

Gamut of strange, chaotic wonderings. A rippling as of apprehension. Fear, at last, seething about her. From them. She feels it, wonders at it. Too late she senses terror stalking deep within the fibres of their beings.

Too late to will herself away. To interpose between these creatures and her person some protecting barrier. All guileless, she. Full young and inexperienced. Too trusting. Innocent with all her knowledge. Too late to check nerve-impulses that motor

down to touch to devastating movement pendant limbs. With death all latent in grim-pointing muzzles. Great, searing globes of spewing fire. Atoms goaded into madness. Ravening. All murderous. Seeking to devour her.

Defenceless, she.

Destroyed.

Fragile, upon the honey coloured grasses. Star-born. Child of gods. Communicant with finite things and infinite.

She is beautiful still in death. Pearly-lustred is her broken skin. Fluidly oozing are her wounds. They stride, the vertebrates, about her form, mouthing things.

Tread softly. Weep. God-made she was. God-loved. Bright jewel. But invertebrate. A pseudopod.

Amœba.

FANZINES

by THE EDITOR

CON-SCIENCE appears to be a one-shot put out by the fans who were put out when SPACE TIMES—originally a Manchester fanzine—started to be produced in London. Eric Jones, who was ST's publisher, Eric Bentcliffe, who was its editor, and Terry Jeeves, who was its art editor, have got together and formed an association called TRIODE for the purpose of publishing their own fanzine again. And good luck to them in the venture. Though I can't help noticing the enormous improvement in SPACE TIMES since it was taken over by London's Stuart McKenzie, I have felt that there was something distinctly odd about the way this fanzine sort of slid out of the hands that gave it birth!

Anyway, TRIODE have launched this item as a first volley, and they have made a fine job of it. The thing, as you may gather from the title, is

all about what to do at conventions if you want to have fun and if you want to stay alive at the end of it. Naturally, it isn't true—I suppose! But it's certainly funny. *Authentic* readers may be interested to know that among the various pieces in publication is one in which conventioners are advised to possess at least one of six different types of false beard with the aim of creating confusion among "the enemy."

Well worth the 9d. (10 c.) charged for it, from 44 Barbridge Road, Arle, Cheltenham.

★

ORION is a peculiar thing that seems to be published and written by Paul Enever (9 Churchill Avenue, Hillingdon, Middlesex), with here and there a short piece by somebody else. I have No. 3 of volume one before me, and I can only say that if you happen to like trivial things put across with the extreme

seriousness of a new-born fan, then this is the fanzine for you. Generously sprinkled with the more puerile fan-handling of words, ORION manages to simulate a high-class tailor's dummy—spic and span, neat and tidy, but empty, nevertheless. It doesn't say how much it costs.

★

HYPHEN No 8 is as good as ever. Though not yet in the region of perfection, this fanzine can teach all other fan editors just how one can be funny and sensible at the same time. Seldom does it contain anything stupid or vapid or downright inane. I suspect that this is because—unlike some fanzines—it is *edited*. HYPHEN has one grave fault, though. It is far too small! It costs 1s. 6d. for two issues (25 c.) from Walter Willis, 170 Upper Newtownards Rd., Belfast, N. Ireland.

★

THE SECOND (1953) AUSTRALIAN SCIENCE FICTION CONVENTION REPORT is not really

a fanzine, but it deserves mention nonetheless. It represents something that has never been done in Britain or the States, as far as I know. It is a complete and exhaustive account of everything that—officially—happened at this Convention. If this report is truth (and we have no reason whatever to doubt it) then the Convention must have been a wonderful thing. I only wish I had been there!

★

ALPHA No. 3 is to hand. This is the splendid publication of Belgium's fans. It is in English, so there is no excuse for fans who speak that language (and some do!) not buying it. It is published and edited by Dave Vendelmans, 130 Strijdhoflaan, Berchem, Antwerp. Coming out bi-monthly, it costs 4s. (60c. U.S. mint stamps) a year. The material is very good indeed, but the editor wants more. I'm sure British fans could help out there.



Projectiles



OVERSEAS SECTION

INTELLIGENT

Please accept a letter of appreciation for a fine magazine that I have been reading regularly since obtaining my first copy eighteen months ago. It is very refreshing to find a non-lurid and progressive science fiction magazine that really wants to print intelligent stories instead of Buck Rogerish blood and thunder. Science fiction was originally based on intelligent surmise, which can cover equally well fields of the mind or mechanical matters. So why the insistence of so-called purists on plain space gadgets? Surely the mind is essential to progress, too?

Miss J. P. Norton-Baker,
55 Pennington Terrace, North
Adelaide, Adelaide, Australia.

Thank you for the kind words, though we hope you realise that intelligent and progressive stories is

really the hallmark of British science fiction in general, and is not solely Authentic's prerogative! We agree with you completely about the mind being essential to progress and a fit subject for science fiction treatment.

TWELFTH MOON

In your article on Jupiter it is said that there are eleven moons. May I remind you that in October, 1951, S. B. Nicholson of the Mt. Wilson Observatory announced that he had discovered a twelfth satellite of Jupiter, probably only fifteen miles in diameter, during a routine photographing of the planet.

W. K. Hollis, 42 Valley Road,
Mt. Eden, Auckland, New Zealand.

You are quite right, Mr. Hollis, and we apologize for the omission. Jupiter's twelfth moon is thirteen million miles from the planet and is thought to have a diameter of about fifteen miles, as you say. It has a magnitude of 18.3 and moves in a retrograde direction. Nicholson shares with Galileo the honour of having discovered four Jovian moons.

MORE PLANETS?

I particularly like your articles and features, especially those that dealt with the planets. I find myself wishing there were more planets. Perhaps you could start a series dealing with the different types of suns. Your magazine is undoubtedly the best British science fiction magazine distributed in South Australia and is certainly on a par with the best American magazines. John Ziegler, 11 Theresa Street, Norwood, South Australia.

Glad you like the non-fiction, John. So do many other readers. Glad, too, that you rate us so highly. We hope we continue to please you.

PEN PAL

Having read all your books from No. 9 onwards I feel that I would like to offer a few of my opinions, for what they are worth. Your covers are the finest I have seen on any science fiction magazine and I hope you will keep up the high standard you have set. Secondly, your non-fiction articles are also tops and are so interesting that I find myself reading these first. Your stories, I feel, are declining, apart from Bryan Berry and one or two others. Some stories to my mind approach ordinary thriller or adventure stories, which, though set on distant planets or in the future, could quite easily be set in the present era on poor old Earth.

If you publish this, I wonder if any other Johannesburger reading it would like to communicate with me with a view to swapping sf books, and I would welcome any

other pen pals of about my age (20) from anywhere.

Keith Bartlett, 20 Emmarentia Ave., Parkview, Johannesburg, S.A.

Sorry that you think we're on the downgrade, Keith, though we wish you had been more specific and mentioned titles. We can't offhand think of any that fit your description, but then, maybe we're biased! Hope you get some pen pals.

DESPERATE!

In desperation I am writing to ask if you could feature a request in one of your future issues for any of the following numbers: 10, 11, 12, 13, 19. These five issues are the only ones I need to complete my library of *Authentic*. If any of your readers have these copies and would like to sell them, I will be only too glad to buy them.

Allan Moston, 24 Lucerne Street, Ashburton, Melbourne, Victoria, Australia.

*We're sure you would, Allan, but we don't hold out very high hopes that you'll get them. Most readers like to keep *Authentic*, and only very recent back numbers are still floating around. Still, keep your fingers crossed!*

SOLID

Whenever I see your cover it says to me: "Here is something that is here to stay!" It is a good, solid looking cover and fitting for a magazine of such quality...

Arthur J. Damarell,
30 Shipster Street, Gorresville,
South Australia.

Thank you, Arthur, thank you, thank you...

HOME SECTION

UNINTELLIGIBLE?

I feel I must congratulate you on a first-class science fiction magazine. The fiction is excellent, although I think *Mary Hell's* could just as well have been a normal fiction story instead of science fiction. The non-fiction is a delightful surprise and I thank you for it. In some parts, however, it is very technical and unintelligible to us laymen. But keep up the good work. By the way, I wonder if any other Scottish reader could write to me about science fiction?

James Gerard McColl,
22 Greenlea Road, Chryston,
Lanarkshire.

James, several people have said that about Mary Hell's, and maybe we made a mistake in publishing it, but—do you, and all the rest, require that science fiction should have no points of contact with reality? Stories like this highlight the possibility that the conquest of Mars will produce problems equivalent to those that cropped up during terrestrial expansions. So many people think only of the glamour of space travel. Now, about intelligibility—it is very difficult to judge the level of technicality that is acceptable to the majority of readers. We are absolutely dependent on readers' letters as a guide. Yours is one. We hope many others will give us their views on this important point.

TRASH

Tomorrow is Another Day, by K. Houston Brunner, I regret to say

“stank.” Why-o-why do you publish trash like this? I may be dumb or something, but it was the best I could do to follow the story, let alone enjoy it. Now for the articles. As I read only three of them I am really in no position to rate them, but I can only say that if I wanted *fact* I would buy a magazine that deals with it, and not a science *fiction* one. So please, no more articles.

Michael R. Birrell, 10 North Street,
St. Leonards-on-Sea, Sussex.

It is a policy of Authentic, Michael, to use stories occasionally that make the reader think; this policy is endorsed by the majority, who do not demand always to race through a story for immediate titillation only. As for the articles, these too are endorsed by the majority—and just where would you find such articles, Michael? Tell us. We'd really like to know.

STOP THIEF!

Don't look now, but somebody's pinched all but one of your interior illustrations! I presume you were short of space, so we won't say any more; but don't give them up just as they were getting better.

Paul L. Sowerby,
21 Lansdowne Road,
West Didsbury, Manchester, 20.

It's all right, Paul, nobody stole them! We're afraid you're going to be disappointed, though, for there will be only one interior illo for quite a while.

EN GARDE AGAIN!

I realise now what a blundering, idiotic thing it was to send in that letter which told how I was not of this world. And to have it published in *Projectiles* was a great mistake. You see, I don't believe the intelligences of other worlds which are on Earth knew of my presence here. If this was so, I may quite possibly have caused great alarm amongst them, and I may be in danger of being destroyed, to put it mildly. I should please like you to give me space in the next *Authentic* to make good my error by apologizing to these intelligences, etc., and telling them that I am an independent intelligence, helped by intelligences on other planets, etc. Michael Jenkinson, 20 Range Green, Tipner, Portsmouth, Hants.

All right. There's your apology. This correspondence is now closed!

MERCER MERCY

Oh, no, it's too much! *The Lever and the Fulcrum*, though short for a lead, is a GOOD STORY. But worse is to follow. *Addict* is EVEN BETTER. I wouldn't dream of accusing you of having changed policy and started publishing good stuff at long last, but at least this issue is worth having. Consider yourself heartily congratulated, even if it is only a flash in the pan.

Re the Revolt Against Space-Flight—a couple of citations:

Lever/Fulcrum is another good example of how space flight SHOULD be used—i.e., purely and simply as a form of transport. *First Down*, on the other hand, though admittedly good, is an excellent example of the sort of Bow Down To The Great Space story that I am fulminating against.

Archie Mercer, 434 Newark Road, North Hykeham, Lincoln.

Will have your little joke, won't you, Archie? Imagine you liking the stories in Authentic! Though we see what you are getting-at, you'll just have to go on fulminating. When we get stories like First Down, we'll publish 'em. Maybe you'll settle down some time, become intellectually mature and understand these stories better. (You don't mind us having a dig at you, do you?)

ENEMIES

Why are people from other planets always enemies? It's not always the same, but this is the basic type of thing.

Brian M. Light, 13 Vine Crescent, Gt. Sankey, Warrington, Lancs.

It's a sad reflection on humanity, Brian, that the people of foreign lands have always in the past been treated as enemies. One of the things that science fiction is doing is making people aware of this, giving them the thoughts you are having, so that when the time comes we may behave in a rather more sensible fashion. Worthwhile?

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AUTHENTIC SCIENCE FICTION Monthly
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AS HEALER. One Lady writes: "My sister suffered very badly for years, but since I gave her a Joan the Wad to keep near her she is much easier. Do you think this is due to Joan or the water from the Lucky Well?"

AS LUCK BRINGER. Another writes: "Since the war my wife and I have been dogged by persistent ill-luck and we seemed to be sinking lower and lower. One day someone sent us a Joan the Wad. We have never found out who it was, but, coincidence if you like, within a week I got a much better job and my wife had some money left her. Since then we have never looked back and, needless to say, swear by 'Queen Joan'."

AS MATCHMAKER. A young girl wrote and informed me that she had had scores of boy friends, but it was not until she had visited Cornwall and taken Joan back with her that she met the boy of her dreams, and as they got better acquainted she discovered he also has "Joan the Wad."

AS PRIZEWINNER. A young man wrote us only last week: "For two years I entered competitions without luck, but since getting Joan the Wad I have frequently been successful although I have not won a big prize. But I know that... who won £2,000 in a competition has one because I gave it to him. When he won his £2,000 he gave me £100 for myself, so you see I have cause to bless 'Queen Joan'."

DO YOU BELIEVE IN LUCK?

?

HURRY

Mrs. WILSON, of Falmouth, says, 1951:
Since receiving Joan the Wad... my husband's health has improved 100%

Mr. Jones, of Cheltenham, says, 1951:
...Send me J.O'Lantern. Since receiving Joan the Wad have won two 1st prizes in Crosswords... John Bull and Sunday Chronicle.

SEND NOW

JOAN



THE WAD

Queen of the Lucky Cornish Piskeys. Thousands of persons all over the world claim that she has brought them Wonderful Luck in the way of Health, Wealth and Happiness.
History free for a shilling
If you will send me your name and address, a shilling and a stamped addressed envelope for reply, I will send you a history of the Cornish Piskey folk, and the marvellous miracles they accomplish.

AS SPECULATOR. A man writes: "I had some shares that for several years I couldn't give away. They were 1/- shares and all of a sudden they went up in the market to 7/9. I happened to be staring at Joan the Wad. Pure imagination, you may say, but I thought I saw her wink approvingly. I sold out, reinvested the money at greater profit and have prospered ever since."

All you have to do is to send a shilling (savings stamps accepted) and a stamped addressed envelope for the history to

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shows our starship, huge as it is, dwarfed against the terrible grandeur of a triple sun system. After several hundred years of steady travel away from the solar system, the starship has reached another stellar region.

Searching for a planet that will be suitable for human life, so that a new branch of humanity may come into being and flourish among the stars, the ship flits like an enormous butterfly from star to star.

Many stars have no planets — or, if they do possess planets, they are too big or too small or too hot or too cold. And so the quest moves on to another star, another hundred years away.

The people on board the ship have never seen Earth. They know of it only by hearsay and records. They know that their great great grandparents were born on Earth, and they wonder what it must be like to feel solid ground beneath the feet and see a blue sky and green fields. For these things they have never seen. The whole vastness and significance of the human race is but a vague idea to them. They were born on the ship and they will probably die on it, knowing only the small compact community that lives, isolated and sealed off, on this massive space vessel.

So, our ship glides in among the triple suns, in search of a planet. One of the suns, the nearest, is an enormous red giant, relatively cool, glowing with a deep vibrant redness. Some two or three hundred million miles from it, hangs a double star—two stars that revolve around a common centre of gravity. So near to each other are these stars that a continuous band of white-hot gases connect them, drawn like tides by the separate gravitational forces.

The tenuous envelope of the purple-hot member streams out behind it as it revolves, thus producing a widening spiral of searing light.

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